



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines


Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>


C 3 9015 00356 667 9
University of Michigan - BUHR



The Hub



**AUTOMOBILES
CARRIAGES
MOTOR TRUCKS
WAGONS**



TRADE NEWS PUBLISHING CO
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN

STAR or KENNY
Sweet Concealed Band

WOOD HUB

WARNER

WHEELS

HEAVY and LIGHT
for
CARRIAGES
WAGONS and
TRUCKS

IF YOU WANT THE BEST TRY OURS



Load—Ten Tons of Coal.

SOLVED! Is the way motor car experts express themselves on the subject of tires for commercial motor vehicles after seeing and using the

KELLY-SPRINGFIELD SECTIONAL TIRE

With a grip on the road that means progress and security from the fault of solid tires—that of crowding the rubber ahead under load, which means disintegration—the motor wagon and truck owner will find in the Kelly-Springfield Sectional Tire the best tire for all heavy cars. Each section is dependent upon itself. If interested, write

CONSOLIDATED RUBBER TIRE COMPANY

New York, N. Y., and Akron, Ohio

Branches: Boston, Chicago, Philadelphia, St. Louis, Detroit, Cincinnati, San Francisco.



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT,  ACORN,  and STAR  BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO.

RICHMOND, VA.

For Export Prices apply to the New York Office.

Type 2—For ALL Straight Side and Clincher Tires. (Clamp Unlocked.)



STANDARDIZATION OF RIMS THAT BENEFITS

**CAR BUILDERS
TIRE MAKERS
CAR OWNERS**

Type 3—For ALL Clincher Tires (Wedge in Position).



The Standard Universal Quick-Detachable Demountable Rims

"FIT ALL TIRES" and SOLVE THE PROBLEM OF INTERCHANGEABILITY

25,000 Sets of Demountable Rims and 135,000 Sets of Quick Detachable Rims; practically 96% of the total number of Rims made in the United States, have been contracted for by 100 leading manufacturers.

Type 1—For ALL Straight Side and Clincher Tires. (Clamp locked.)



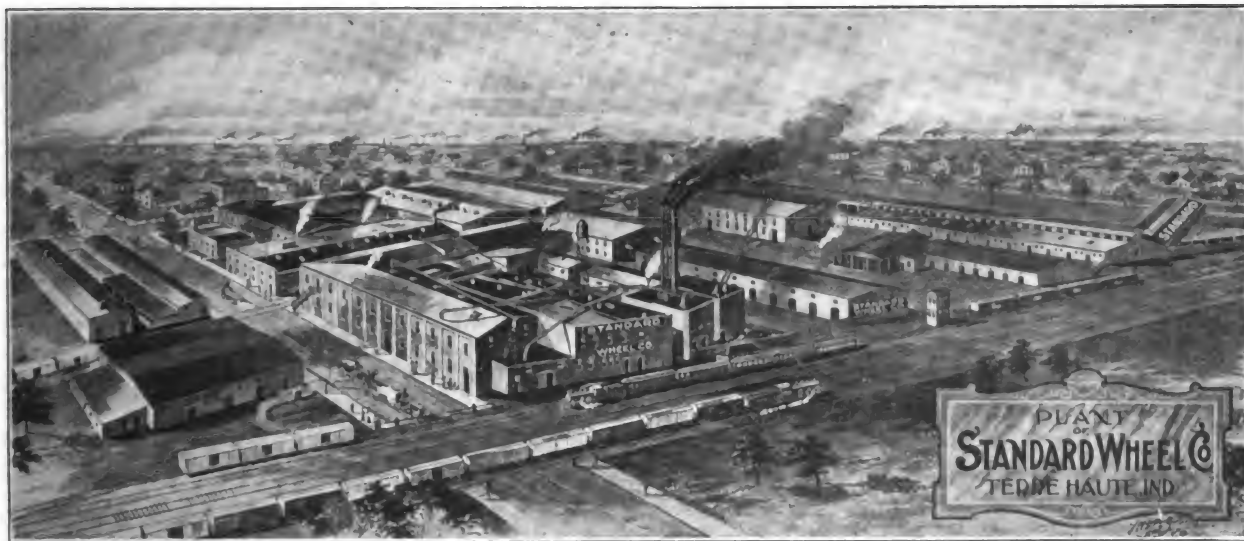
Write for illustrated descriptive matter.

THE UNITED RIM COMPANY

AKRON, OHIO

Type 3—For ALL Straight Side Tires (Wedge in position.)





VEHICLE WHEELS AND WHEEL MATERIAL

Three Separate Departments Light Carriage and Buggy Wheels
Heavy Express Wagon and Truck Wheels
Automobile Wheels

OUR GRADES ARE UNEXCELLED

WRITE FOR LIST.

Terre Haute, Ind. STANDARD WHEEL CO. Terre Haute, Ind

Please mention "The Hub" when you write.

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York,

Chicago,

Minneapolis,

Kansas City

**THE
A. T. A. NELSON CO.
Cincinnati, Ohio**

Cut Leather

**All Sizes, All Grades
Pole & Shaft Straps
Auto Straps**

Vehicle Trimming Specialties

WRITE US QUICK

**THE
A. T. A. NELSON CO.
Cincinnati, Ohio**

JOHN REILLY Inc.

Established 1865

MANUFACTURERS OF ALL GRADES OF

LEATHER

**FOR THE
Carriage & Automobile Trade**

**PARTICULAR ATTENTION CALLED TO
OUR AUTO SPECIAL**

**FACTORIES,
Avenues C & D, Murray & Astor Streets.
NEWARK, N. J.**

**AGENTS,
Cincinnati—National Hardware Co., Fourth Street
Detroit—C. W. Findlater, No. 313 Forest Ave., West**

Please mention "The Hub" when you write.

We Offer In **PROTEKTOL** The Ideal Paint Vehicle

PROTEKTOL is the result of careful study and scientific research for a carrier to produce a perfect paint film.

Paints made with PROTEKTOL as the vehicle, look better, wear better and last longer than any other paints now produced. They flow perfectly and dry to a smooth, elastic film, free from the pores so objectionable in linseed oil paints.

The inherent drying property of PROTEKTOL obviates the necessity of adding driers for outside work.

Convince yourself of the merits of PROTEKTOL by giving it a practical trial.

The use of PROTEKTOL means Perfect Paints as well as money in your pocket.

Write to-day for descriptive pamphlet.

70 Cents per Gallon.

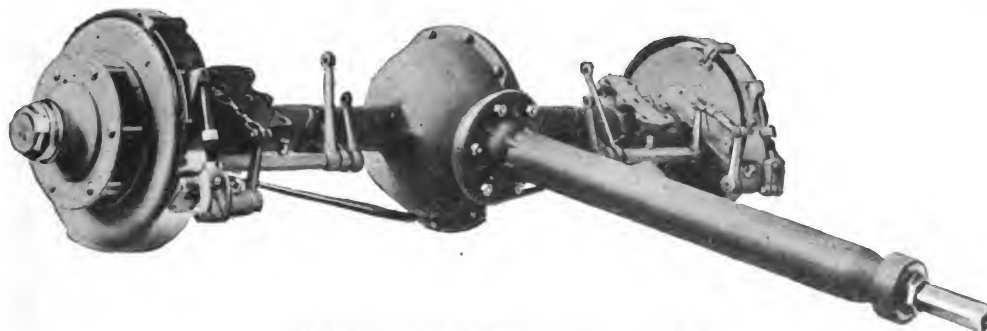
THE AULT & WIBORG CO.
VARNISH WORKS
CINCINNATI.

Branches:

New York, Philadelphia
Buffalo, Toronto
Montreal, Buenos Aires

Branches:

Chicago, St. Louis.
Minneapolis, San Francisco
Mexico City, London, Eng.



THREE-QUARTER FLOATING.
TYPE 14 FOR CARS WEIGHING UP TO 2800 LBS.
" 19 " " " " " 2000 "

HOUSING IS STAMPED FROM SHEET STEEL, AND PROVIDES STRENGTH AT THE POINTS WHERE THE STRAIN IS THE GREATEST.

INTERNAL AND EXTERNAL BRAKES ARE 12" DIAMETER.

HUBS CAN BE EQUIPPED WITH ANNU-LAR OR ROLLER TYPE BEARINGS.

DRIVE SHAFT AND AXLE SHAFTS ARE MADE FROM ALLOY STEEL "HEAT TREATED SO AS TO GIVE THE HIGHEST PHYSICAL PROPERTIES POSSIBLE.

DRIVING PINION FORGED FROM NICKEL STEEL DRIVING GEAR FORGED FROM CARBON STEEL. BOTH PINION AND GEAR ARE "HEAT TREATED." TEETH ARE PLANED.

THE DESIGN, MATERIAL AND WORKMANSHIP ON THESE AXLES ARE OF THE HIGHEST QUALITY.

Write us regarding your requirements.

THE AMERICAN BALL BEARING CO.

L. S. & M. S. RY. and EDGEWATER PARK
CLEVELAND, OHIO

Please mention "The Hub" when you write.



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

¶ Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
New Haven, Connecticut

WILLEY'S COLORS

The **RECOGNIZED STANDARD**



C. A. WILLEY CO.
COLORS GRINDERS

and Manufacturers of Specialties in

**CARRIAGE, AUTOMOBILE AND CAR
PAINTS**

COLORS, VARNISHES, ETC.

HUNTER'S POINT, NEW YORK CITY

Headquarters for "The H. D. Smith & Co.'s" Carriage and Wagon Forgings

JACOB GERHAB

Dealer in

**Carriage Cloths, Leathers and Trim-
mings, Wagon and Cart Material**

Salable prices and all information cheerfully furnished.

158, 160, 162 and 164 North Third Street.
PHILADELPHIA, PA.

ESTABLISHED 1855

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

**AUTOMOBILE
WHEELS**

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply any style demountable or detachable rim or tire.

THE SURPRISE IS YOURS

When You Open Your First Can of

MOORE VARNISH

Easy Working Perfect Flowing Long Lived

Highest Quality Under Every Label

BENJAMIN MOORE & COMPANY
Varnish Makers

New York Chicago Cleveland Toronto

KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

It fills the pores of Metal and Wood perfectly. Sandpapers easily and produces a fine, smooth surface that DOES NOT CRACK, SCALE NOR PEEL.

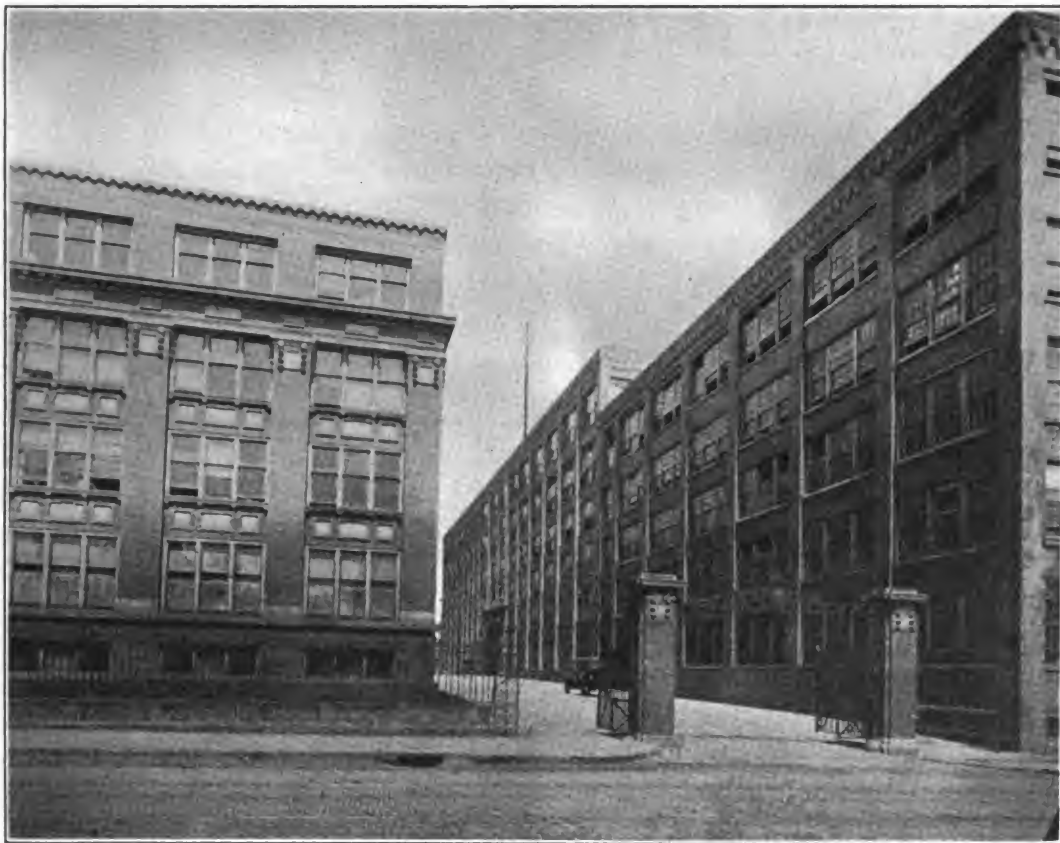
POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

Please mention "The Hub" when you write.

GOODRICH "SERVICE"

The Entrance to Rubber Street



In the building on the corner (at the left) are the General Offices.

The two large buildings on the right are devoted almost entirely to the Departments of Tire Building.

The B. F. Goodrich Company
Akron, Ohio.

VALENTINE & COMPANY

NEW YORK
CHICAGO
BOSTON
TORONTO
PARIS
AMSTERDAM

VALENTINISHES

We call attention to TWO NEW high-grade Coach and Auto Varnishes that have been named

Durable Flat (Mat) Finish

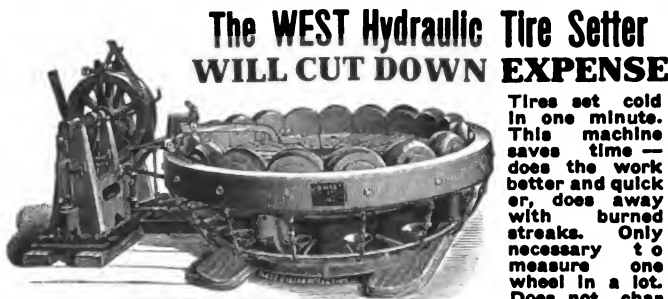
AND

Durable Flat (Egg Shell Gloss) Finish

THESE are absolutely new products in Varnish Making. They achieve the *lustreless surface finish* **WITHOUT RUBBING** or the use of wax or any other deleterious substance, and perfectly meet the new requirements of Coach and Auto Work.

They are quick driers—24 to 36 hours. They work as well as the regular finishing grades. Get more detailed particulars than can be given in an advertisement. They are sent on request.

Enamels are furnished with the same mat, or egg shell gloss effects when so ordered, and any desired color can be supplied.



**The WEST Hydraulic Tire Setter
WILL CUT DOWN EXPENSE**

Tires set cold in one minute. This machine saves time — does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim and

thus make the tire loosen prematurely. Saves re-sandpapering of wheels.

This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO., ROCHESTER, NEW YORK

Jones Wheels

BEST ON EARTH

KANTSAMORE

**Phineas Jones & Co.
Newark, N. J.**

MOLLER & SCHUMANN COMPANY

COLORED RUBBING

Most perfect as to working, drying and wearing.

CARRIAGE & AUTO VARNISHES

Send for color card and descriptive price list.

Chicago Branch - 110 N. Desplaines St., Office and Factory - BROOKLYN, N. Y.

Please mention "The Hub" when you write.

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

APRIL, 1911.

NO. 1.

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, *President.* G. A. TANNER, *Secretary and Treasurer.*
24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00
AMERICAN HARNESS AND SADDLERY
DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Fore Door Construsion.

The evolution of motor body building has now reached a stage where both front and rear seats are inclosed.

This was a natural step when the body was given its high side lines and generally flush construction, but its first manifestations were crude, not to say inconvenient.

Everything mechanical was right in the way of the body builder.

The engineers seemed to be able to think of no reason why the hand levers should change position, so the body builder had to figure out what to do with his panels to adapt the shape to the needs of the levers.

Finally the engineer gradually saw the situation as it appeared to the man of lines and contours, and he straddled the problem, putting one lever inside, one outside the body. This was quite as much as the engineer could be expected to understand about the subject at once as the root of the difficulty was not a square root. So it didn't appeal.

The next step both levers jumped over the panel to the inside, and all seemed well, until some peevish customer, probably, asked why there should not be doors on both sides of the car, rather than only one.

This was yet another new thought to the man of cogs

and wheels, but he did at last comprehend how perfectly natural such an arrangement would seem, so he up-rooted his levers once more, and planted them facing the center of the front seats, and called it "center control."

Here, finally, we got a construction and adjustment that no doubt would have been suggested by the body builder in the first instance if he could only have gotten a line on the way the brain of the engineer worked, its wonders to perform, when it was a question of body construction.

The evolution of the motor car is getting to the point where all refinements of construction are being made in the interest of the passenger. About the only survival of the "bump the bumps" is the taxi, with its short frame and nickel-diameter wheels.

The next move might possibly be to remove the wheels from each corner of the frame and get at work on an adjustment of springs to frame wheels and body that would finally banish altogether the liver-cure motion administered to the patient trying to glue himself to the rear seat.

Atlantic City for Convention.

The announcement from Secretary McLearn in this number settles the place and date of the coming convention of the Carriage Builders' National Association.

September at the seashore is ideal. The place decided upon is just the nicest spot on the coast. The hotels are luxuriant, abundant, and range in price from moderate to "late limit," so all purses can be accommodated.

Make it a point to have Atlantic City at convention time on your list as a place you must (emphasis on must) go to, both for the pleasure of the outing, and the splendid comradeship that will be yours.

Advertising an Advertisement.

"Do you think an automobile is expensive? Well, it isn't. There is a four-page, three-color advertisement in Pearson's which proves that it is not—that an automobile is not an expense—that it is an investment. It shows specifically what experience and scientific experiments have done toward changing an automobile from an everlasting expense to a profitable investment."

This is an advertisement from a daily paper. The publicity promoter who is responsible for such remarkable stuff must have been taking his most recent jag "on the high." If he is geared like the usual advertising agent, there must be a reverse speed somewhere in his little "insides," and it is a great wonder that his pay boss does not throw it in.

We suppose it must have impressed most discerning people by this time that that happy, ingenious child of fortune, the "publicity promoter," has worn his ingenuity to

a frazzle, and has really become many kinds of the picturesque burro. The only interesting speculation is: How much longer can he impose on the simple mind that is responsible for his pay envelope.

We have never seen one of these fair young creatures alive. But we know them from having them prepared as lantern slides to illustrate stories without words, like *The Marble Brow*; or, *The Frozen Front*. The fauna of the species is easily studied through the self-laudatory publications the brotherhood utters for private circulation among the elect. The guild, from the photographs and biographies, is seen to be made up of dear children anywhere from 16 to 22, highly precocious, but unable to dissemble the fact that they yet linger in the pantalette stage of intellectual development. It is one of the curious phenomena that these babbling little dears could make out to obsess a real man with money to pay that they were palpitating live wires, not merely animated meal tickets. But it looks as if the gasoline was running low in the tank, and that many publishers will miss a source of supply of "copy" paper that was so bountifully supplied by the man who lured his boss into the belief that what was being mailed really appeared in print without consideration.

Those Dreaded "Dumped Bodies."

Our well informed, and altogether charming contemporary, Mr. Cooper's British spokesman for the English coach builder seems to think that the American cheap auto trash may be deflected upon the British isles; but never mind, "Britons have the men, and have the money, too," which last is what the Yankee "dumpers" are looking for, so the insult to true and substantial work will be drowned in ignoble £.s.d. Mr. Cooper says it so well, we shall take the liberty to repeat his song:

No doubt English manufacturers will be well prepared to meet this new form of competition, which arrives at a time when they are slowly overtaking that of their leading European competitors. Coachbuilders will not be pleased to learn that the American manufacturers propose in most cases to send the cars over completely fitted with bodies and accessories, for though they may be able to do better in the agency branch of their business, they will certainly feel the effect of these large quantities of dumped bodies. On the other hand it may very well be that those British motor car manufacturers who turn out light cars, much better built though dearer than the American, may find it advisable to give those clients who want a thoroughly well built and comparatively high-priced small car something better and more luxurious than the poorly built factory bodies with which they have hitherto been fitted, and to entrust the work to coachbuilders of reputation.

Whether the American invasion will meet with success as regards the public it is too early yet to tell. The cars are much lighter than similar ones of British build, and are therefore much easier on the tires and cheaper in other running expenses. They are also, owing to the elimination and simplification of parts, much easier to look after. On the other hand, in constructional details they are distinctly inferior. Drop forgings, stampings and pressed metal work are extensively used, and although these may go for lightness and cheapness, they cannot add to the durability of the car. However, there may be a public who value the point of cheapness more than that of durability. That there is a very large number of people of this opinion in America is evinced by the great success of firms turning out this class of car.

Second-Hand Automobiles.

We hear so much and constantly about new models and up-to-date this and that it almost seems as if the used automobile must chemically dissolve like chalk in water, and become something different.

But a man has finally found that the second-hand car is a theory, not a condition, hence it may be a mere abstraction. He explains his point, does this man, by a concrete illustration. This is what he says:

A certain dealer recently allowed a customer \$1,500 in trade for a 1907 model of a certain car, which cost the user \$1,600 in the first instance. The condition has largely grown out of the erroneous theory that trading a new car for a second-hand one, and obtaining a few dollars "to boot," is making a sale. By the widest possible stretch of the imagination, such a transaction could not be classed within the category of salesmanship. Anybody can give away goods.

Automobile dealers who engage in such transactions will, in the course of time, when the motor car business gets down to a real competitive basis, find themselves in a different class and commanding a different consideration from what they now enjoy. It is unnecessary to say that the scale will be lower down. Some motor car dealers think they are now experiencing competition. Dealers, as yet, have not learned what the word "competition" means.

Thus, we infer there are no second-hand cars. It is merely a matter of "boot," which becomes in time booty, we suspect, unless these constant swappings end in disaster.

We learn, too, from this sage that the rigors of competition are not yet felt, but—just wait! Our friend says this competition will come in "the course of time," which gives the notion of something sure, but as yet far away. Then is when the used car will become a condition, not a theory, and the garages will be full of them.

It has always seemed to us that a builder should be rather proud to find a car of his make that was more than two years old and still performing daily.

The Argument.

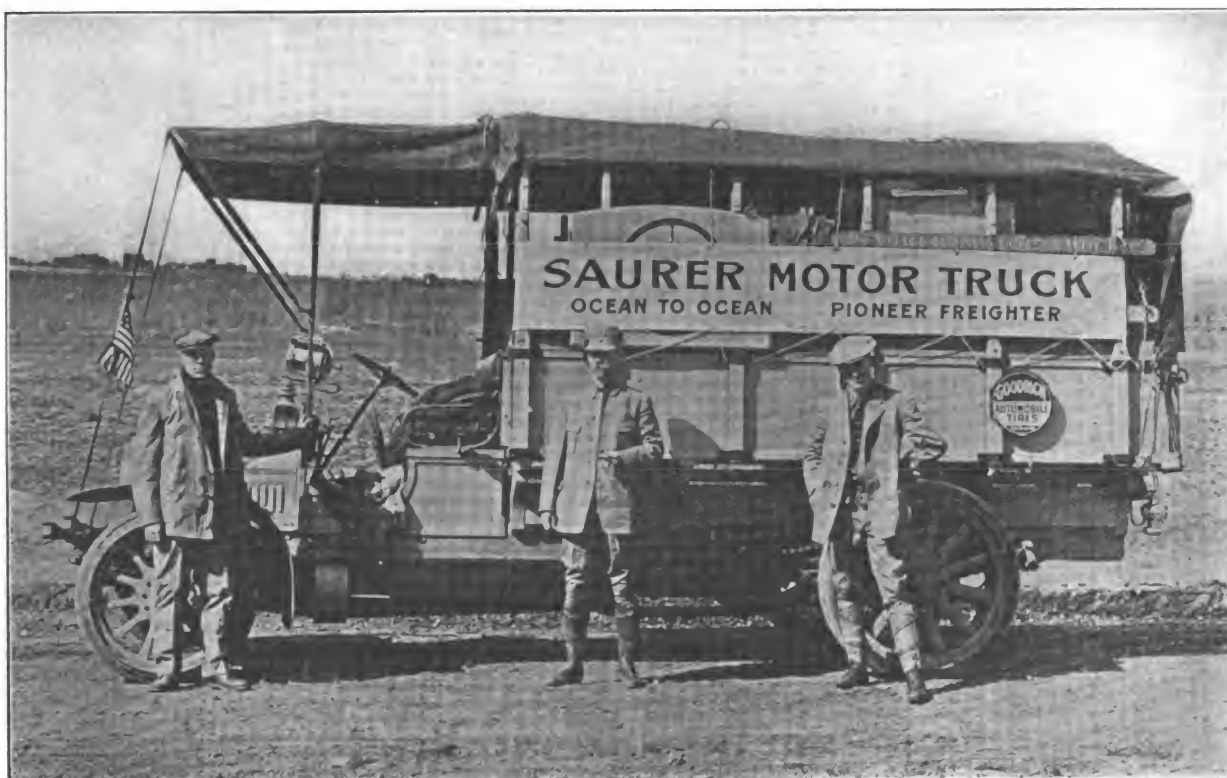
The producer of the commercial motor truck is adjusting himself to new sales conditions in marketing the business vehicle. He is fortifying himself with arguments, and is being fortified from many directions, both paid and volunteer.

Some of the arguments seem to be very sound and timely, but others are quite strained, as when the expert (?) considers the hay crop, and computes its entire value as being saved because there will soon be no horses to eat it. This vast sum that is put away is mortgaged in several directions other than the claim the horse has on it, and is not very potent as a sales argument, we would suppose. It arises in the publicity branch of the plant, and is due to the ingenious press agent part of the organization.

We hold to the opinion that the personally attached advertising sales promoter will not be so useful in fostering the sales of commercial vehicles as he was helpful in distributing pleasure cars. The business is one based on facts for argument and appeal, and these are very repugnant to the imaginative advertising man, whose facts are based on fancy and whose fancy has its source in dreams.

The commercial car has much that may be said to its advantage in a common sense spirit, but at the moment its friends are partizans rather than advocates, and are committing the blunders of the over zealous, so that the peril of slopping over into the ridiculous is continually present.

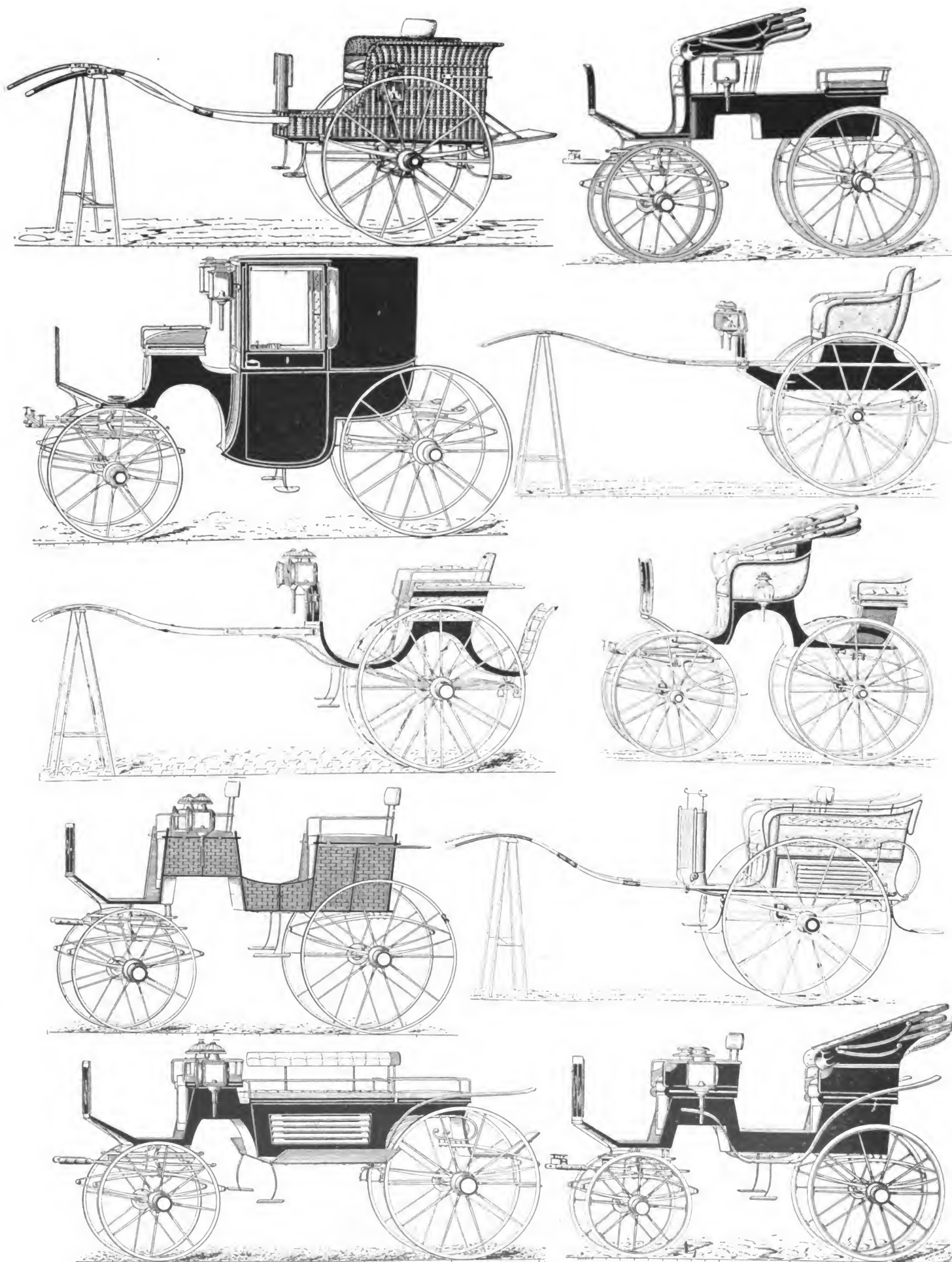
We hardly think the makers of cars are at fault. They know and understand the limitations, and the tremendous inertia that has to be overcome.



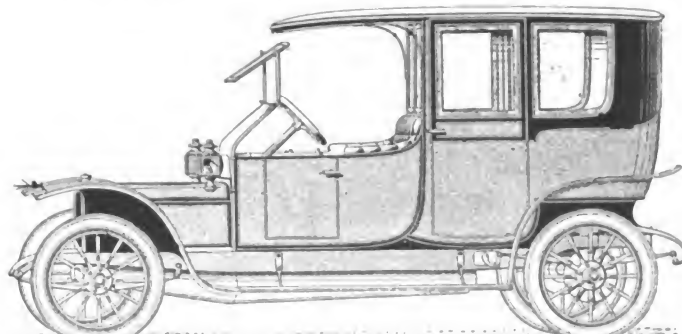
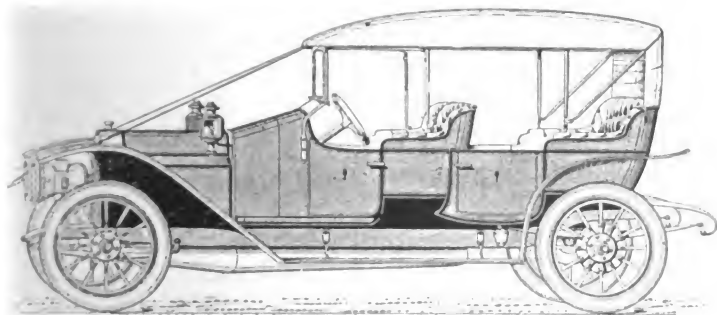
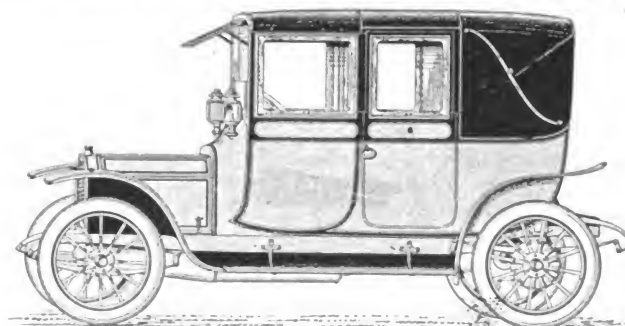
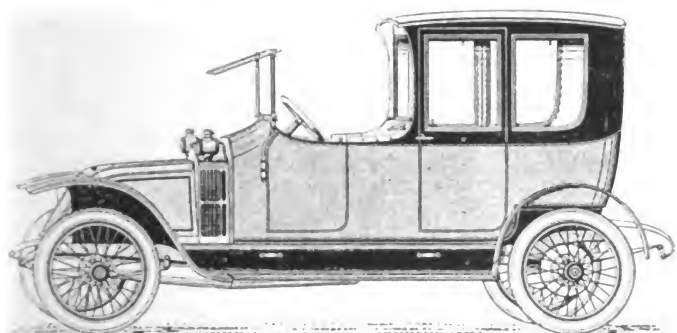
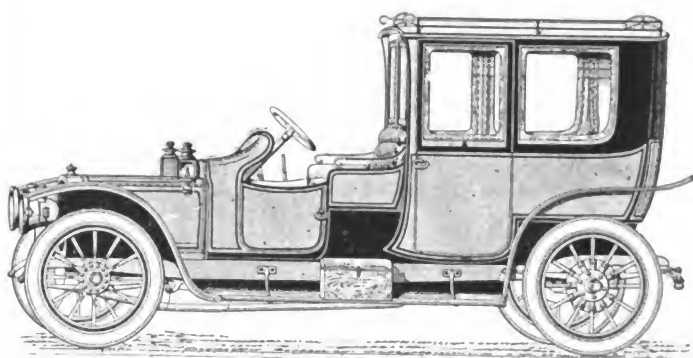
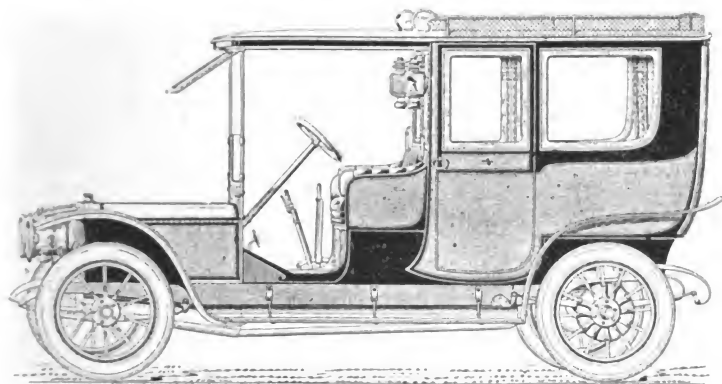
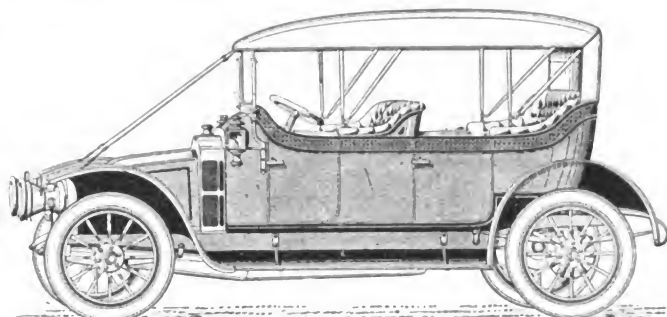
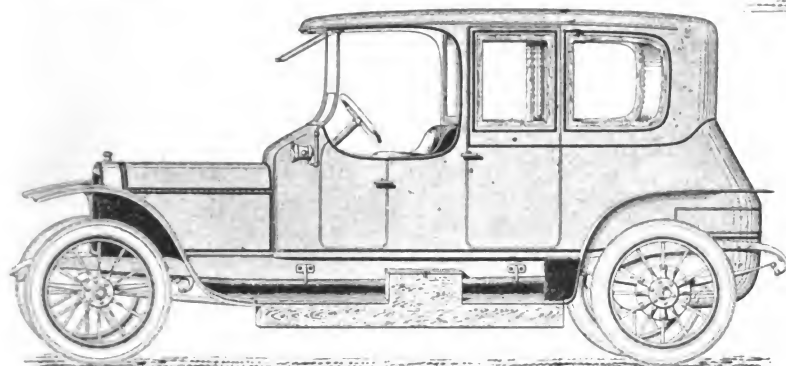
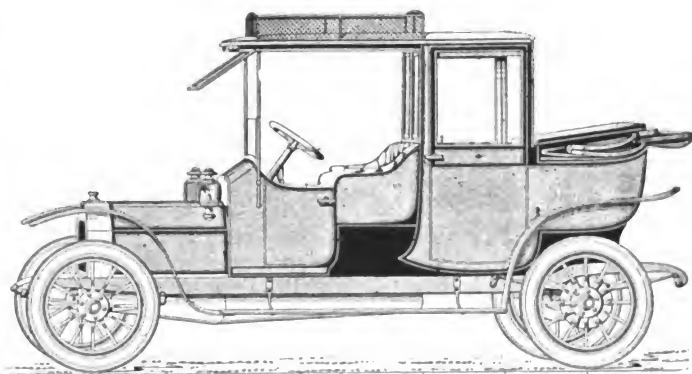
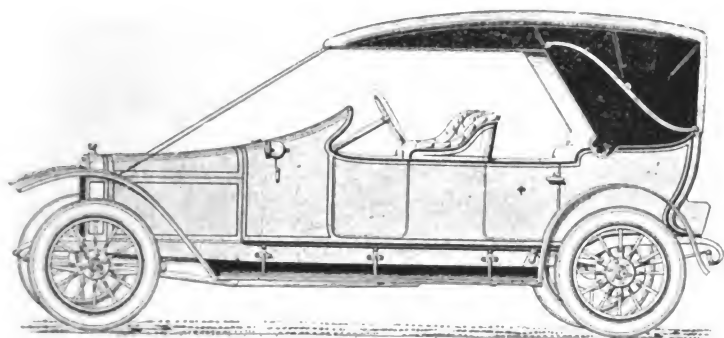
SAURER TRUCK.
Making a Record Transcontinental Journey on Goodrich Tires.



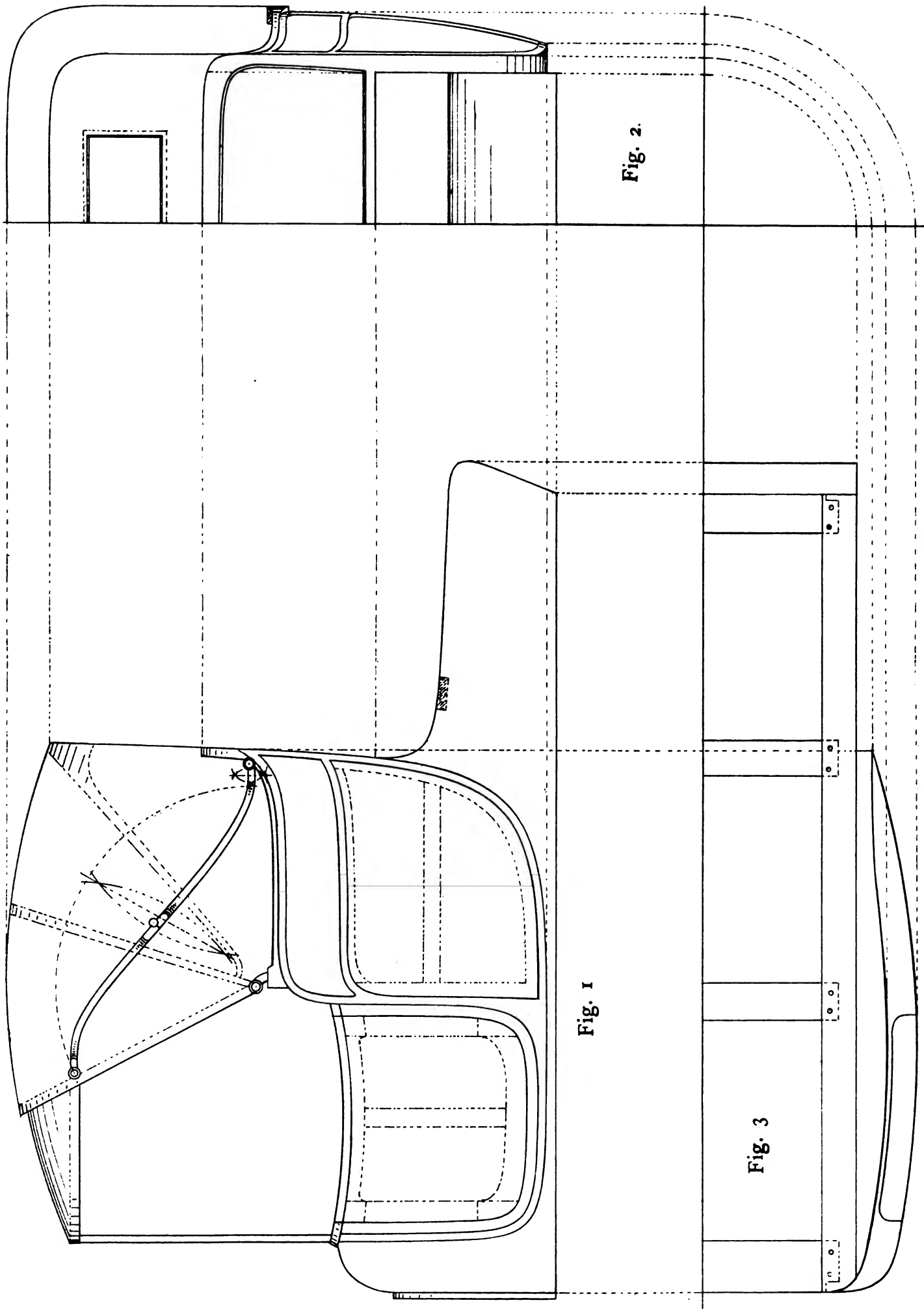
TYPE B COMMERCIAL TRUCK.
Built by Geneva Wagon Co., Geneva, N. Y.



RECENT EXAMPLES OF FOREIGN VEHICLE FASHIONS



LATE FOREIGN MOTOR CAR TYPES.



WORKING DRAFT OF A PHYSICIAN'S MOTOR CAR BODY.
(Described on Opposite Page.)

Wood-working and Smithing

WORKING DRAFT OF A PHYSICIAN'S MOTOR CAR BODY.

(Drawing on Opposite Page.)

There is a demand for a light car, suitable to the needs of physicians and other professions. The design which we give here is a long step toward the solution of the styles which would suit those to whom such a light vehicle appeals.

An engine of light design, and speedy action, is necessary to the completion of a car to fulfill the conditions. The design possesses features that lift it far away from the catalogued and stereotyped lines.

The lines of the draft enclose a deep cabriolet quarter which is cut up with a waist panel and molded to harmonize with the elbow line, and the front moulding line of the pillar. The waist panel moulding also harmonizes with the depth of the door, and from these points gives good balance. The hind controlling line of the quarter starts from a slight sale and graduating to a quickened curve and flowing into a flat bottomside line, and again pronouncing itself on the bonnet quarter pillar. The door is lined to harmonize while its depth gives a protective covering from windage. An accessory rumble boot is a necessity to a body of this character, the storage of an extra wheel tire and fittings for immediate adjustment of engine parts, and their temporary repair, are most essential. Therefore in the designing of this style of body, provision must be made for the reception of these essentials, while the necessity of a properly fashioned rumble adds to the style of the vehicle as a carriage of dignity.

It will be seen that the depths of the rumble side decrease from the body pillar to the hind end of the boot. The increased depth at the pillar allows the side to be curved down to its top line, thus giving a strengthening grip on the pillar and an artistic line to the side. The top of the boot may be made with lids to open up, or a door can be made from the back, or both ways may be used as a store entrance for the packing of accessories.

The hood is fitted with three slats as in an ordinary cabriolet carriage body and with the same kind of slat and hinge fittings. The head would be quite up-to-date if it were also fitted with an automatic spring lifter, such as are now used in all high class manufacture. These may work inside jointing or in conjunction with outside joints as in the draft.

To make the entrance to the car more roomy the front head slat is kept at as slight an angle as possible, while to compensate for this a horizontal hinged slat is projected forward and rests on the top of the windage light. When the hood is down the horizontal slat hinges up and is slid down a rod guide on the inside of the head slat until it comes level with the top of the hood, which is then let down on to the elbow props as is done in horse-drawn cabriolet carriage bodies, so that the ordinary carriage body maker will find little difficulty in adapting himself to this class of body work.

The elevation shows in Fig. 1 the full design of the body in outline and the lines of its framing by chain line, and the spacing of the head slats to the curve of the head. The position and center joint is also shown of the side joints; a false elbow is shown on the top of the elbow line. The inside squabbing is fixed to this false elbow as also is the head leather and plated beading. A hood in a motor of high finish as this is required to be should be covered with the best enamel leather, which looks richer and wears better than any composite head covering material on the market, while it at once stamps a carriage with a superior finish far ahead of any of the cheaper leathers used for

this purpose. Good material, good finish and rich design are nearly always associated with the very highest workmanship.

Fig. 2 shows the half back view of the body and the design of the paneling is shown up by the moulding. The size of the back light as fixed into the head leather and the cross measurements of the body are all shown in this section.

Fig. 3 shows the half plan of the body's construction in outline and its widths. The rumble boot is half check-framed to the bottomside and screwed to the inside of the bottomside and the corner pillar. These timbers are dressed up square on the controlling outline face. The waist rail of the body is got out in the solid and the mouldings panel boxed, which is much better than framing with two elbows, and groove paneling in between. The waist rail is, of course, got out to the body sweep and gauged off to $1\frac{1}{2}$ in. thickness. The body is framed as ordinary cabriolets are done and the sham door pillar got out in its dressing in the same way. The door is framed and paneled. The front quarter pillar to which the door is hinged is framed into the bottomside and the moulding boxed up in the solid; the framing and the paneling is worked round sideways and from the top to harmonize with the size outline of the bonnet.

The sizes for building are as per the drawing: Full length of body on chassis, 7 ft. 9 in.; width of body on chassis, 37 in.; width of body on elbow line, 40 in.; across top pillar, 50 in. Full depth of body quarter on front pillar line, 32 in.; depth of waist panel over mouldings, $8\frac{3}{4}$ in.; depth of quarter on door line, $29\frac{1}{2}$ in.; width of door, 24 in.; depth of ditto at center, $21\frac{1}{4}$ in.; width of front quarter from door line, $8\frac{3}{4}$ in.; width of body at front door line, 47 in.; depth of boot side at top of curve point $21\frac{1}{2}$ in.; at front cross bar, 14 in.; at extreme back, 13 in.; the sides of the boot stand square up.

Width of hood sideways as in the elevation, 3 ft. 8 in.; width of horizontal slat, $18\frac{1}{2}$ in.; depth of hood from hinge center, $29\frac{1}{2}$ in.; depth of back as at Fig. 2, $18\frac{3}{4}$ in.; size of back light, 20 in. by 9 in., over beading. Width of bottom of body on pillar door line, 3 ft. 6 in.; full width of bottomside at hind boot, $4\frac{1}{2}$ in. The bottomside is framed in connection with five cross bars.

YELLOW BIRCH HUBS.

It is only in the last eighteen or twenty years that yellow birch has been used very extensively for wagon hubs, the wagon manufacturing industries obtaining all of the white oak hubs they needed up to that time; but as oak began to get scarce they had to find a suitable hardwood to take its place, and consequently thousands of sets of yellow birch hubs are being used annually.

In the northern part of Wisconsin, says F. W. Pool, in Wood-worker, we find yellow birch in abundance, also many of the hub mills. A good many of the large lumber companies sort out their birch lumber as it is decked in the woods, selling the smaller sizes to the hub manufacturers, realizing much more for it than they could by sawing it into lumber, as the hub mills use the stock as small as 8 inches. Then again, in scaling hub lumber, which is usually bought by the lineal foot, the logger is not cut on his scale for crooked logs, as all hub stock is cut into short blocks, ranging in length from 9 in. to 15 in., whereas, if these same crooked logs were to be sawed into lumber we would not get more than 50 per cent of the full scale of the stick.

The price of hub stock varies some, according to the size and quality of the timber, usually ranging from $4\frac{1}{4}$ c to 6 c per lineal foot; at this price the logger realizes about \$16 or \$18 per 1,000 feet for his small timber.

To make good hubs all of this birch must be cut during the winter months, before the sap goes up in the spring. Hub mills

that use large stocks of birch and run the year around, are so situated that they can put all their stock in the water where it will keep indefinitely.

The first automatic hub-making machine was built in 1868. This machine was the first attempt to turn hubs otherwise than by hand, by means of the common wood-turning lathe.

Under the hood, at the rear of this machine, a rotating cutter-head, for roughing off the hub stocks, was fixed, receiving its power from an overhead counter, which also drove the tight and loose pulleys represented on the main spindle. The finishing knives were shaped to any desired pattern and screwed fast to the stands, which, in turn, were securely bolted to the deck of the cross-carriage. Thus, it will be understood, the roughing and finishing heads of the machine moved simultaneously, one retreating as the other advanced to the work, and vice versa. These knives were set at such an inclination as would most nearly imitate the angle at which the hand tool is usually held.

The first step in the manufacture of hubs is the cut-off saw, where all the blocks are cut to the required length and sorted out for the various boring machines. The boring machine is very heavy, arranged with self-centering jaws to hold the block and fitted with a solid steel reamer to remove the soft portion or heart of the block, boring a hole the required size and taper to fit the mandrel upon which it is to be turned.

It is very essential in boring these blocks that they are all bored exactly in the center or heart, to make good hubs and prevent ring checks in the cups. After the blocks have been bored they pass to the turning lathe and are turned ready for the mortiser. The hub to be mortised is held at one end in a three-jawed chuck, the other end turning in a taper cup, and is automatically presented to the chisels by the vertical movement of the bed. When the mortise is cut, it descends by its own gravity. A dial is attached to the head spindle, having as many notches as there are mortises to be cut in the hub, the dial moving one notch to turn the hub every time a mortise has been cut, the number of mortises being determined by the wagon manufacturers who use the hubs. Some call for hubs mortised for ten spokes, others for twelve, fourteen, sixteen and eighteen.

After the hub is mortised it is sent to the re-reamer, where the hole is rebored to the desired size and taper to fit the box, and all the chips are removed from the mortises, when it is ready for the steam vat.

These vats are usually built of concrete, as the acid from birch timber rots the wood, rendering building them of lumber very unsatisfactory. The steam is turned on very slowly at first, gradually increasing for the first three or four hours; this is done to prevent checking from too sudden a change of temperature. After steaming the hub for eighteen or twenty hours it is ready for a coat of paint, oil, or creosote, pure linseed oil and mineral paint being used most extensively for this purpose. It is only during the last year that creosote has been used for birch hubs, and it is as yet an experiment, although it is used on oak to destroy the worms and prevent decay.

WELDING CAST STEEL.

A compound for welding cast steel is made this way: Mix 41 5-10 parts of boracic acid, 35 parts of pure dried common salt, 15 to 26 parts of ferrocyanide of potassium, $7\frac{1}{2}$ parts of resin, 4 of carbonate of sodium. When this compound is to be used a sufficient quantity is scattered upon the article to be welded, which has been heated to a strong yellow heat and the welding accomplished in the usual way.

"DEADERS" FOR EAST AFRICA.

Orders for hearses for delivery at the port of New York for shipment to East Africa have been received from that country by the Grand Rapids (Mich.) Carriage Co. Some of the finest equipages built will be sent on this long journey. The firm is encouraging its foreign business.

BOLTS AND NUTS.

It may look like the proper care and use of bolts and nuts should be understood by everybody and need no special elaboration, says Wood Worker, yet even in this enlightened day there appeared recently, in some of the automobile papers, a bit of advice that calls for comment and a little elaboration on bolts and nuts.

In this bit of advice it is pointed out that when one has a bolt or a nut that is loose and seems inclined to slip threads, the day may be saved by winding a small string around the bolt; that will make the nut tight and also cause it to grip the threads. This is an old makeshift remedy that has no place whatever in clean-cut mechanics. A nut should fit snugly on a bolt, and whenever it is so loose that it slips threads, it is not only unreliable, but in some places becomes dangerous, and should not be tolerated at all. It is time then to either get a new nut or a new bolt, or both.

Many a bolt and nut is spoiled by overstraining with wrenches. Some of them may be weak originally by not fitting tightly enough. The ideal nut is one that fits snugly and holds firmly, will not rattle and cannot be spun around with the finger, but moves easily, yet shows that it has a full depth bearing in the threads. Given a nut of this kind, and it should be handled with some regard to its size and strength. Use only such wrenches as belong to the size nut, and use them with sense, so as not to strain the nut, but get it tightened firmly with a pressure commensurate with its dimensions.

CARE OF LATHE CENTERS.

Bruises or bumps are usually caused by laying the centers among the lathe tools where other tools, such as wrenches, files or hammers are liable to be dropped upon them. When the centers are not in position in the lathe spindles they should never be laid down among the lathe tools nor in any other place in which there is a likelihood of their being bruised. When out of the lathe they should be handled like eggs, the least bruise being enough to make the center run out when again put in the spindle. All such bruises are also sure to mar and spoil the hole in the lathe spindle. Lathe tools, wrenches, files, dogs or work should never be laid down on the ways of the lathe bed. Carelessness in this respect will result in bruises in the ways which will throw both the tailstock and carriage out of line when run over the bruised spots. All these accessories should be laid on a board lying on top of the ways behind the tail stock. In this board holes can be bored, so that the centers can be stuck in these holes whenever it is necessary to remove them from the spindles. If there are any visible bruises on the shanks of the centers they should be carefully removed with a fine file and the shank polished and wiped clean.

HOW TO PROPERLY KEY A PULLEY.

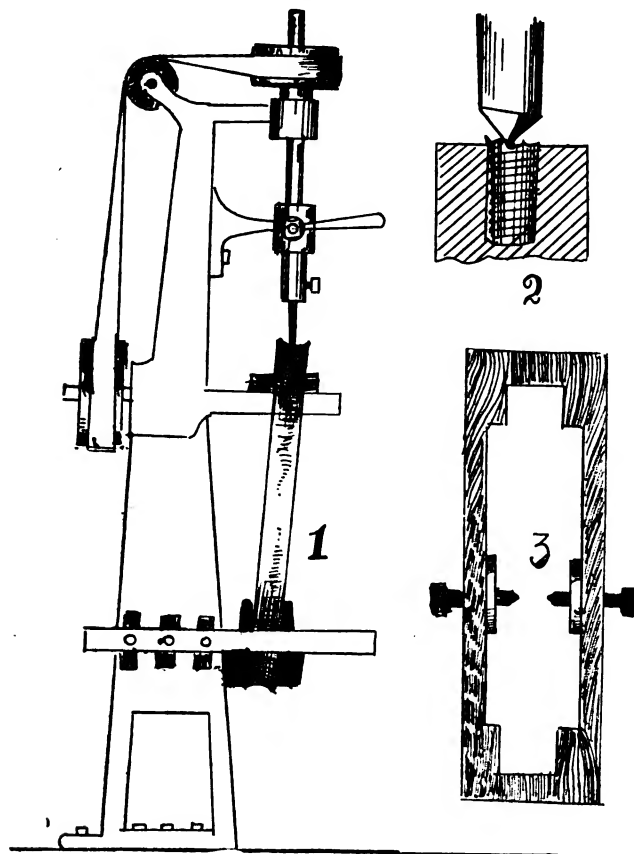
It is something of a trick to key a pulley so that it will not work loose after a time, says Popular Mechanics, especially if the pulley is large and runs at a high rate of speed. In making the key, care must be taken that it be of uniform width and fit the seat in the shaft and the pulley snugly. The key should be driven tight, but not so tight that it will kink under the blow.

If the pulley runs with the hub against the box, which is the usual way, allow only about 1-32 inch end play between the box and the pulley.

When an old key is worn too thin, but fits properly otherwise, place a strip of tin under it to make it fill the keyway closely. To draw a key, a small end of which is projecting, hold it with a pair of pliers, pry against the hub on the shaft with a hammer. This will loosen both the pulley and the key. If the key is cut off flush with the pulley, it may be necessary to remove the shaft and drive from the inside, in which case it is well to drive the pulley on a little, to loosen the key.

SHOP NOTES ON WIRE WHEELS.

If you have only an upright drill in the shop, you can drill rims of wire wheels as shown in Fig. 1. It may be a new rim that you have in hand or perhaps an old one in which some additional holes are to be bored. The first factor is to make sure that the holes are going to be at regular intervals. Often the holes are



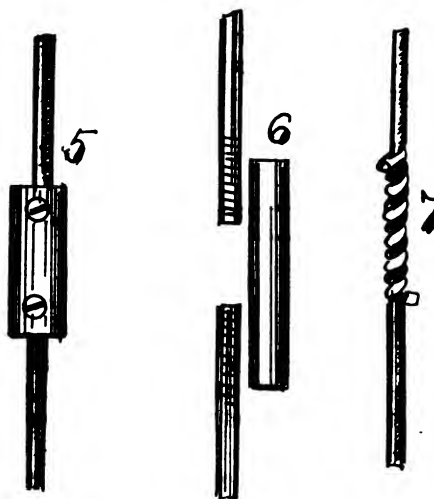
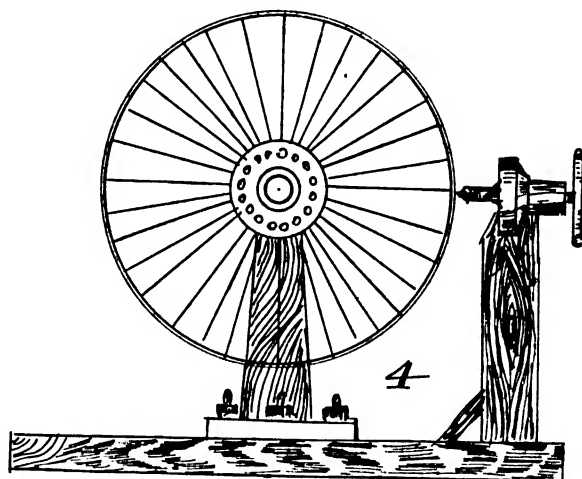
drilled without proper measuring, in which case the intervals will vary. Get your compass out and mark off, and use the prick punch to start the holes. You have got to preserve the symmetry of the wheel, and you cannot do this if the wire spokes are going to be fixed into irregularly drilled holes. Hence the holes should be very accurately cut, and this means care, good drilling points and even markings. Some men undertake to bore the holes with a brace and drilling tool especially made. But you cannot get proper pressure with the shoulder brace. A good, substantial drill is the best. You can bore the rim holes on the horizontal drill as well. But in case you use the upright, you simply rig a brace of hardwood to steady the lower part of the rim as shown in this cut. You can readily bolt the piece to some part of the machine frame. The brace is arranged to support the rim at the proper angle so as to make sure of getting the holes correctly drilled. You can tilt the rim either way to get the proper angle. Holes can be drilled rapidly this way.

Sometimes a vehicle is brought into the repair shop with a spoke broken off, leaving the stub in the hub as in Fig. 2. The thing is to remove the stub. Often the spoke of a radial wheel will snap off in such manner that difficulty will be experienced in removing the obstruction so as to admit a new spoke.

I have seen men saw, hack and bore with cold chisels and various tools in an effort to get the broken piece out. Other men bore out the thing whole, making a larger hole thereby, making it necessary to put in a spoke of larger size, thereby destroying the spoke plan of the wheel. You can get the threaded part of the broken spoke out by simply using a flat drill having a blunt diamond point. The cutting edges on the drill must be left handed, however, as the threads of the broken stub are right-handed. Hence you turn the drill to the left as you bore with it into the ruptured stub end. Soon after beginning the bore you will no-

tice that the threaded stub shows signs of loosening. Keep at it and in a little time the stub will get turned free and out, leaving the original hole with the threads unharmed, so that a new spoke may be admitted.

Often the only work required in connection with a set of wire buggy wheels is truing. The owner of the carriage may not know where the trouble is. He may think something serious is the matter and may order a new set of wheels for his rig. But the experienced eye of the repairman frequently detects untrueness of the wheels as the cause for the unsteady running of the vehicle. He then proceeds to true the wheels and tires to overcome the wabby motion. Fig. 3 is a cut of a device which is useful for truing wire wheels. It is a home-made device. You simply select a good piece of clear hardwood, one and one-half inches thick, and wide and long enough to admit cutting out the interior for a size suitable to accommodate the largest wheels you intend to handle. In the middle of the space thus cut out, you can fix the necessary metal bearings threaded for the support of the side adjusting screws. These screws terminate in a pricking point or center, so as to fit on either side into the prick hole of the shaft supporting the wheel in process of truing. Thus the wheel is correctly trained in the center of the device. The wheel rim revolves in the outer squares where you can gauge the same quite easily with a try-square or specially constructed truing tool. Any



untrueness of the rim will reveal itself very readily in this frame and the untrueness can be corrected.

To get an untrueness, in the rim proper, a frame like that in Fig. 4 can be employed. This consists of the base piece of oak, four feet long, 2 inches thick and 4 inches wide. To this base piece is screwed the upright on which is the journal to carry the wheel axle. Then there is an upright bolted at the end of the base piece to carry the gauge as shown. With this gauge point

properly set, you can revolve the wheel and quickly detect any infraction from regularity and correct the same.

Fig. 5 is a screw union for securing two ends of a fractured spoke. Fig 6 is a union in which the connection is made by cutting threads on the two broken ends of the spoke. Then a right and left thread are cut in the connector, so that by screwing up on the same, the two ends of the defective spoke are drawn together. Fig. 7 shows a rough way of interlocking two broken wire spokes by entwining one about the other.

RUBBER MANIPULATION.

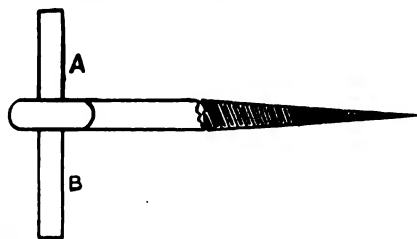
Rubber buyers are represented as being in a state of some apprehension. The cause for uneasiness lies in the supposed conditions in the Para district where a movement is said to be under way involving the rubber accumulation by a syndicate. But whether an ordinary market operation is in progress or whether the Brazilian government is interested and has in view a "valorization" project, remains to be determined.

Following a gradual and protracted decline from the high-water mark of \$2.95 last April, a turning point was reached on January 19 of this year, when the quotation on upriver fine Para was \$1.13. By the end of the month it had reached \$1.25, and it has since continued to soar, the increase during the week of February 17-24 amounting to 18 points—said to be the most spectacular advance on record. The quotation on March 1 was \$1.66-\$1.68. Furthermore the shipments of rubber from Para for the past seven months and the corresponding period of a year ago reveal a falling off of 2,850 tons, while the receipts of the United States are over 9,000 tons short on the same basis. In addition to the amount withheld at Para 2,500 tons are said to be stored in Europe.

Something in the nature of a syndicate agreement was arranged last fall between the commissioners and gatherers of rubber, respectively, at Para and Manaus, to store and hold rubber at the ports in order to control the price. It has been stated that the banks which are aiding the movement have received specific instructions to make loans both on stocks in hand and future arrivals at 9 per cent. Receivers who turn their stocks into the pool draw 75 per cent. against the receipts in advance and participate in any profits, while those who refuse to enter the syndicate have their stocks bought up at market prices.

GETTING OUT SPOKE STUBS.

Take a $\frac{5}{8}$ -inch lag screw, with a good sharp thread, and cut the head off. Then draw out, turn eye and then take a piece of $\frac{5}{8}$ -inch round iron, six inches long, and weld it in the eye. One



does not need to use wrench or to screw against box. Bore in with 9-16-inch bit and screw in the lag screw as an auger. Then take hold of the handle at A and tap with hammer at B.

PLENTY SHOPS NEED SUCH AIR.

It is now possible to turn on pure and invigorating air like electric light—by snapping a switch. The ozonizer can be attached to any electric light socket. Its function is the production from the atmosphere of ozone, a colorless gas which possesses extraordinary antiseptic and deodorizing qualities. By means of the new invention the invigorating air of the mountain top can be brought into the household.

ADVANTAGE OF ELECTRICITY IN SMALL SHOPS.

That electricity is doing good work for the blacksmith may be easily determined by looking into some of the smith shops. And the electric current is not only running the blacksmith's blower, but it is being used to operate his drill, his power hammer, his emery wheel and every other machine that can be operated by power, says the American Blacksmith.

The convenience of the electric current is beyond question—a twist of the wrist and your machine is running at full speed. There is no fire to start, no coal to shovel, no steam to get up, no crank to turn, no coaxing of a cold engine cylinder and piston into activity. A turning a switch, a whirl as the motor starts, and your machines are ready for work.

The installation of the electric motor is also extremely simple. In the case of one large motor, used as power for the entire equipment of machines, the motor should be located at a convenient point, where it can be belted to a line shaft, and where it will also be free from flying dust, dirt and grit. The foundation should be solid and, while it is by no means necessary to spend the time, trouble, labor and material as for a gas engine foundation, still the motor should run on a foundation that is strong enough to hold it solidly, and to keep it from vibration unduly. If space permits, it is best to fix up an "engine" room for the motor. It isn't, of course, necessary to use a large space, but enough to allow one to get at all sides of the motor, with space for such supplies as oil, belting and such other power supplies as are needed from time to time.

In the case of individual motors for each machine, or group of machines, the motor should, of course, be placed as conveniently as possible. In the case of a blower direct connected with a motor, it is of course, necessary to place the blower and its motor as near to the forge as possible. This insures the full power of the blower being delivered to the fire, and prevents undue loss of blast, which it is impossible to avoid where a long blast pipe is used and many turns made.

As a means of lighting electricity needs no introduction to the smith shop. The number already using electricity for lighting is surprising, and from the lighting stage to its use as power is but a step. It simply means the removal of a light bulb and the attaching of the motor feed wire.

VEHICLE AND IMPLEMENT SHOW.

The securing of permanent headquarters and the incorporation of the National Vehicle and Implement Show at Peoria, Ill., with a capital stock of \$20,000, were some of the developments in the program of the Commerce Association. The association directors decided to locate the headquarters in the new Cole building in the 300 block South Jefferson street, and will take a lease for a term of years. The incorporators are John C. Scully, W. R. Coleman and George C. Powers. The object of the company is to conduct fairs, shows and expositions of every kind. No sooner was this step taken than the Avery Company, through its president, announced it would take \$1,000 of the stock at once. Similar assurances were received from other concerns.

"BIG DEAL."

The biggest deal ever made among the industries of Kenosha, Wis., was announced March 8 in the sale of the plant of the Bain Wagon Works to a new company composed of George Yule, George A. Yule and W. L. Yule.

All of the stock in the company, valued at \$1,500,000, was taken over by the Yule family and the deal marked the retirement of the Bain family from the control of the plant after they had been in charge for more than sixty years.

The purchase price was made in cash. George Yule, who was the leader in the deal, had gone to work for the company in a menial position in 1852, but for a number of years he had been president.

DEAD; LEFT MONEY; OF COURSE, INSANE.

To the Editor of The Hub:

The late Mr. A. G. Brunsman was one of the very few carriage builders who had "made good" during a life-time of strenuous carriage building. Ours is not a business that produces its millionaires with that ease with which they are turned out by the "Big Business" methods. If one of the men who has, by some malefic conjunction of the planets, been consigned to a business career of buggy building, rises superior to the conditions, and makes the astoundingly brilliant success scored by the late Mr. Brunsman, then it must be conceded that we are studying the course of a man of talent or genius.

Men so equipped by nature are said to be crazy, because the mediocre man must have some excuse for the paucity of his own brains and success. All men of great brain function, in all time, have been said to be demented. It was supposed to be one of the characteristics. The man centered on one idea in our own time, successful or not so, is called a "crank," which is slang for lunatic, of course.

During the lifetime and business of these true captains of industry, there are occasions when critical acquaintances are free to market their opinions to the effect that the man is "plumb daft" because he has essayed some feat of business out of the usual course, but which lands the prize. Then it is that lucky (!) fellow!

Mr. Brunsman in his modestly strenuous life went right along doing the impossible in the buggy business, probably ruined his good health as the result of his smiling strenuosity, and died worth some three-quarters of a million dollars, just at the time of life when a man should really begin to live. A few days before he retired to a hospital from which he never emerged alive, he met his lawyer, had luncheon, discussed business matters, and with that business acumen that had enabled him to achieve the amassing of much money, proceeded to devise what was his according to his will, and then had it done up into a will and witnessed by the lawyer and the doctor. How could a sane man have called on two more trustworthy witnesses than two such intimate professional friends? It was as wise a step as any one of his business plans could have been.

Well, we learn by the local press reports that the doctor has made a visit to the judge who had the matter of probate in hand, and has said that (quoting the local paper) he had not understood all that he had sworn to when the will was probated. To continue the quotation, "On hearing this, the court at once notified Lawyer Dale to be in court with Dr. Zwick on Thursday, and when they got there they found Brunsman's widow also there with Judge Peck, her attorney."

Mrs. Brunsman is number two. Mr. Brunsman has also a mother, sisters and brothers whom he did not neglect. Now observe the estate melt as the effort proceeds to show with effect that the deceased must have been crazy. There is no other reason for the proceedings, it is just the fear, we assume, that it might be neglected to inscribe on the gravestone eulogy that: here lies another very successful man who did not know, with all the precedents before him, that he was just naturally sure to be crazy after he was no more!

Very truly,

C. H. E. REDDING.

RUBBER TIRES SAID TO OUTLAST IRON.

"Rubber tires, if they are of proper weight, will outwear any iron tire," said B. J. Westcott, of the Westcott Motor Car Company, who through long years of experience in the building of both carriages and automobiles, has conducted many experiments as to the mileage and life of tires made of both materials. "Who ever heard," said Mr. Westcott, "of any iron tire on a wagon or a buggy standing up for 15,000 to 20,000 miles of continuous service? Yet that is no unusual mileage for rubber tires over the same roads and under the same loads, but at a faster rate of speed."

CARRIAGE BUILDERS' WEEK AT THE SEASHORE.

The Carriage Builders' National Association will hold its annual convention and exhibition at Atlantic City, N. J., during the last week of September of this year, the dates being from the 24th to the 30th inclusive.

Undoubtedly this will be one of the most successful meetings ever held by the C. B. N. A., both from the standpoints of interest and attendance. Every vehicle builder is earnestly invited and urged to attend. Nothing is more pleasant than to meet one's fellow craftsmen, exchange ideas with each other and have a good, sociable time together. The exhibition will be the "largest ever," and the supply trade will show many things that the vehicle builder ought to know about—in fact, must know about, if he desires to be ranked as a progressive and up-to-date manufacturer.

The annual convention of the C. B. N. A. is the most important occasion of the year to the vehicle builders, and it is not a question of "Can I afford to go," but rather one of "Can I afford to stay away?"

It is not too early to begin planning now to take the whole family and spend a week at the most famous resort in the whole world. During the time set for convention the great rush of visitors is about over, and, although there will be plenty to do and much to see, one will find that the hotels will not be crowded and consequently better service and more comfort can be secured than would be the case while the summer throngs were in evidence.

There will not be a man in attendance at the convention but who will look back upon the week at Atlantic City, spent in company with so many of his brother tradesmen, as one of the most enjoyable periods of his life. Meet us at Atlantic City in September!

FAULT OF THE LOCAL PAPER.

Several publications in mentioning the incorporation of The Cook Carriage Co., of Bloomville, Ohio, got the names of the incorporators mixed with those of the North Baltimore Stone Co. The Hub is included in the list, making the error in the March issue by giving the names of Thos. Gifford, Wren Bolin, H. E. Bair, W. E. Bliss and J. E. Shaw as the incorporators. The names should have been C. G. Cook, G. H. Stewart, Jr., J. A. Klahr, J. Miller and C. R. Bolen. The officers of the new company are C. G. Cook, president; J. Miller, vice-president, C. H. Stewart, Jr., secretary and treasurer.

NEW CONSOLIDATED TIRE BRANCH.

The Kelly-Springfield tire interests have arranged for a branch in Atlanta, Ga., from which the needs of eight states may be supplied. A couple of very energetic young men will supply the business-getting motive power. They are J. D. Cary, who is a fifteen-year veteran in the tire industry, and very familiar with the South as a field, and W. W. Heindell, formerly with the White Company as Atlanta representative.

SUPPLEMENT TO CATALOGUE 18.

The automobile and carriage hardware specialties made by The Walter W. Woodruff & Sons Co., Mt. Carmel, Conn., have been increased and the new articles are illustrated and described in a supplement to Catalogue No. 18.

CATALOGUE "F."

The Cortland Forging Co., Cortland, N. Y., has issued Catalog F, showing a very extensive and varied line of carriage and automobile forgings. This is the kind of desk literature that we think returns a good income. It should be a part of the working equipment of every shop.

HICKORY SUBSTITUTE.

Up to within the past year or so it was generally thought that Australia had nothing which could be used as a substitute for better grades of American hickory, says the Australian Coach-builder. The value of blue gum and spotted gum has long been recognized and both will play an important part in the future development of the carriage trade. While equal to hickory for certain purposes, neither, as hitherto placed on the market, have entirely commended themselves to the trade. They are considered to lack essential qualities of hickory, especially for buggy spokes, rims and bent stuff, though both are now being used in considerable quantities for light wheels, etc. The objections urged against these timbers are mainly that although occasionally some first rate specimens are produced, the blue gum offered lacks toughness and evenness of quality essential for a perfect wheel, there being a harshness or brittleness in the tang and tenon and a want of resiliency, while the spotted gum spoke is dark in color, of an oily nature, and stiff and unyielding in comparison with the best American article.

Another timber has been placed upon the market which, if anticipations are realized, will completely solve the hickory problem, as far as Australia is concerned. This "Australian Hickory" is said to exist in unlimited quantities in the immense scrub forests which extend for 1500 miles along the coast north of Brisbane. Several other varieties of timber have from time to time been called "hickory," but that to which we now refer, and from which high grade sarven wheels are being manufactured, bears a close resemblance to hickory, being similar in texture, weight and general characteristics. It is of a slightly yellowish color and even in quality. In actual tests it is claimed to have proved superior to hickory in crushing, tensile and breaking strain, and possessing all the qualities of a tough, strong and durable timber for light vehicle work.

This timber is said to have been first brought under notice some 15 or 20 years ago along the Richmond River in New South Wales, where it was much sought after for axe handles, etc. The number of trees was limited, and they were soon cut out and the timber forgotten until comparatively recently, when it was discovered that the same timber was obtainable in Queensland. Once the value of this timber is recognized the question of supplies becomes an all important one for the coachbuilder.

RUBBER OVERCOMES THE JOLT.

Consul A. W. Brickwood, Jr., Tapachula, Mexico, says that successful experiments in the use of rubber tires on a heavy horse-drawn vehicle suggests not only the introduction of such goods but also the possible sale of automobiles. Most of the streets of Tapachula are paved in the so-called Spanish style—cobblestones laid with little regard to method or uniformity of size and sloping to the middle of the street, where the gutter is located. Only the strongest kind of rig will stand the heavy jolting and jarring in driving over them. For pleasure riding two-wheeled cars are generally used. The most comfortable of these, devised by a resident of this city, has a body hung rather low and with strong and rather large springs. Once the use of rubber tires is proven feasible, it is believed that the owners of other rigs would adopt them. The residents of this locality are well-to-do merchants, planers and professional men, many of whom have private rigs.

TIRE SELLING COMBINATION.

Four makers of solid and pneumatic tires, the Continental Caoutchouc Company, of New York, G. & J. Tire Company, of Indianapolis, Hartford Rubber Works Company, of Hartford, and Morgan & Wright of Detroit, have formed an organization, which will be a large tire selling company. Branches and distributing agencies will be established. The officers are: President, E. S. Williams; vice-president, C. J. Butler; general manager, J. M. Gilbert; secretary, Samuel Norris; treasurer, E. A. Hathorne.

TOOL HARDENING METHODS.

Improper hardening leads to trouble many times, both with tools made from carbon steel and also those made from high-speed steel. In recent years many shops have added to their equipment one or more pyrometers, the management being convinced by some glib-tongued salesman that mistakes in the heating of steel were impossible if one of their devices were connected to the heating furnace. Now, under many conditions a pyrometer is a valuable addition to our equipment, writes E. R. Markham in *American Blacksmith*, but its installation does not warrant our trusting valuable tools to the care of a poor workman. It is a well known fact that, as a rule, the institution of complicated automatic machinery generally calls for the employing of more careful operatives. But the amount of work turned out more than compensates for the cost of the machines and help. In the installing of a heat-measuring instrument we should look on it as a means of enabling our skilled hardener to produce more and better work, and not as a means of replacing him with a poorer, and consequently, a cheaper man.

A pyrometer, if it is correct, registers the degree of heat at the end of the instrument in the fire, not necessarily the temperature of the piece steel in the fire. In order to accurately gauge the heat of the steel in the fire we must determine by tests the variation in the reading of the instrument. For instance, a tool made from a certain steel may require 1400 degrees Fahrenheit to bring it to the proper condition for hardening. In order to bring it to that temperature it may be necessary to heat the furnace so the pyrometer reads 1450 degrees, 1470, or even higher.

THINGS NOT WHAT THEY SEEM.

An English trade journal states, because of the discovery that a number of brushes of foreign manufacture had been sold under a false trade description, the British Brush Manufacturers' Association has made an official announcement respecting the description of brushes and brooms made by its members, the association including all the large brush manufacturers in the United Kingdom. Each firm is bound therefore to guarantee that the use of the various trade descriptions in connection with the produce sold shall mean that the brush or broom consists of the material mentioned in the description. For instance "bristles" must mean the hairs of a hog, pig, or boar; "hair" the hairs of an animal, but not whalebone or feathers; "badger" or the name of any other animal means the hairs of the animal named. This new understanding is welcomed as an important step toward purification of trade and greater commercial honesty.

CANADIAN BANKRUPT TO BE REORGANIZED.

The assets of the Dominion Motors Co., of Walkerville, Ont., which went into involuntary liquidation, have been purchased by Enoch Smith, of Detroit, acting for Detroit and Windsor (Ont.) interests. It is the intention to reorganize the company and to continue the operation of the plant.

CHICAGO TOP COMPANY IN TROUBLE.

F. M. McKey was appointed receiver for the Chicago Auto Top Co. March 23, and has taken charge of the concern's property at 1507 Michigan avenue, Chicago. The assets consist chiefly of stock and tools, open accounts and one automobile, their value not being stated.

DINED ITS OLD EMPLOYES.

The Detroit Carriage Co. entertained at a dinner seven employees who have been with the company for more than twenty years. Those honored were William W. Keith, superintendent; William Smith, Oliver Whiteman, William Harris, John Merrill, Murray Gould, Matthew Kremp.

Carriage and Automobile Painting

BOSTON AND NEW YORK STYLES OF LETTERING.

The letters of the Roman alphabet are claimed by wagon painters, as well as sign-writers, to be most commonly adapted to their needs. There are many varieties, among them the Boston and New York full Roman. A comparison of a few sample letters belonging to these classifications will explain their distinctive points, so that the reader will be able to understand.

Fig. 1 shows the letters A, B, and C of the Boston Full Roman alphabet. As will be seen, the letters are characterized by hair-lines and peculiarly curved lines throughout.

Reference to Fig 2 will show the variations that distinguish the New York Full Roman. In the latter, everything set or stiff is avoided in curved lines. The O, for instance, is easily curved all around, while in the Boston style it is a perfect oval. In the Boston, the curves are distinct and sharp; in some cases they resemble

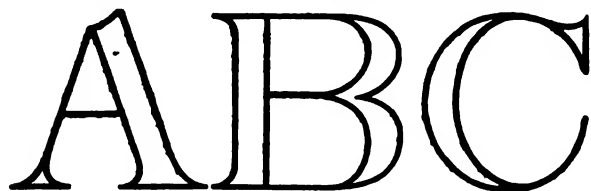


Fig. 1.

ble the small end of an egg, as in P and R, and others involve an actual break or point, as in S and the tail of R. The grace lines are long and sweeping, and differ entirely from the corresponding ones in the New York letters.

The body of the letter is about square, as a general rule, although it may vary slightly in this, as in some other points, with the taste of the artist. The thickness of the letter is two-ninths of its height, but some painters make the very small letters a little more, and the very large ones a little less than the general observed thickness. The hair lines or spurs extend to the right or left from the grace of the letter a distance equal to three-fourths of the thickness.

Another peculiarity of the Boston letter is that the lower part is made a little broader or heavier than the upper. Thus the lower curve of the B projects slightly beyond the upper and is a little thicker; the lower arm of the E extends a little beyond the one above, and is also a little heavier; and the cross-bar of the B and H is a little higher than the center. All these peculiarities tend to give the letter a heavy look at the bottom and make it stand firmly on its base.

To better understand how to measure and designate the different parts of these letters, and to understand the parts of the different letters, we present, in Fig. 3, a diagram of the letter B, with measurements and names of the lines, which will answer for the whole alphabet:

A B, I J, spurs; E F, M N, thickness; B E, G J, small curves or grace lines; B C, J K, spread of the grace; D R, S T, L Q, hair lines.

The thickness of E F is about two-ninths of the height.

The width of E N, G P is about seven-eighths of the height.

The thickness M N, O P is a little greater than E F, G H, on account of the curved lines, which cause the thickness to appear less than it really is.

The hair line S T is a little above the center.

The distance B C is a little less, and J K a little more than one-half of C D.

The lower grace G J is a little longer than the upper grace B E.

Fig. 4 shows the style of lettering known as the Boston Straight Roman.

In this letter the small grace lines which characterized the full Roman letter are wanting, and many parts of the letter are composed of entirely straight lines, from which it derives the name of Straight Roman. The description of the Full Roman letter will answer very well for the Straight Roman, with the exception that all remarks concerning grace lines, as connected with the thickness, are to be omitted, and that the letter does not occupy quite as much space.

Fig. 2 shows A, B, and C of the styles known as the New York Full Roman.

New York painters will not concede that any other styles of letter is equal to this, and we must say that for wagon lettering or where it is intended to shade the letter it is the most appropriate. It is bolder and therefore more easily read and its peculiarities make it entirely different from the Boston letter. As regards wagon lettering, the Boston style does not meet the needs of the artist as perfectly as the New York style does. The only place where we would advise the use of the Boston is on tablets or ribbons without shading.

The outline of the New York Full Roman is bold, the small or hair line thick or stout, and the body of the letter solid and strong; the curves are easy, rather than exact; in fact, everything stiff or set is avoided as much as possible. The C, G, O and Q are not made a perfect circle, but with easy, graceful curves; the small curves are short and sharp and assist in giving the letter its bold look; the spur or short line extends over the letter about three-fourths of the thickness; the width of the letter is generally more than its height; and the short lines, or air lines, are made one-fifth or one-sixth of the thickness.

As the Roman alphabet is the one most in use among wagon letterers, and is in fact the root of their art, a detailed description will not be out of place.

The best way to study this or any alphabet is by beginning with O and comparing its height with its different parts. Thus we use the dividers, and find the thickness to be about one-fourth of the height, the width of some of the letters to be more, and some less than the height, and so on; and in this way, by correct copying and careful practice, the learner will gain a good idea of



Fig. 2.

them, also see what a useful letter the O is as a means of studying the art of lettering.

The body of the Full Roman A is broader at the bottom than at the top; the cross-bar is two-fifths of its height, and it comes to a point at the top, which point should never be less than the thickness of the hair line, and this is sometimes cut off parallel with the upper line and sometimes at a slight angle. The width of the B is the same as its height; the cross bar is put a little above the center. The right hand curves extend the same distance from the upright part of the letter, and the lower curve should be made to extend a very little beyond the upper.

The width of the C is greater than its height, and its thickness should be more than the B; it is not a perfect circle, but an easy, graceful curve, not to be described by the dividers. The extremity of the lower hair line should be made heavier than the other parts.

The D should be made wider than its height, its principal diffi-

culty being the sweep of the large curves, for which the eye alone must be depended upon.

The E should be made wider than its height, with its cross a little above the center. The same may be said of the F, which is sometimes made a little narrower than E.

The G, like the C, is not a perfect circle, but an easy curve, its thickness and width being the same as that of the C. The lower

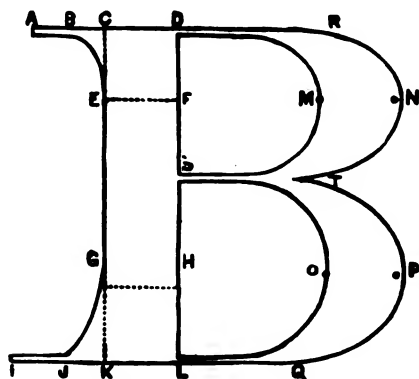


Fig. 3.

right-hand part may be made less than the usual thickness. The horizontal line should be placed below the center.

The width of the H is equal to its height, with the cross at the center, or a little above. The I requires no particular remark.

The J will bear being made a little narrower than the other letters, and its ball should be placed considerably below the center.

The K occupies the same space as the H, the point where the right-hand stroke intersects the perpendicular part of the letter varies with the taste of the artist, but three-sevenths of the height will answer as a general rule.

The L and M are wider than the other letters, while the N is made narrower.

The O and Q are not perfect circles, but have the same graceful curves as the C and G. Their width is greater than their height, and they look better a little thicker in their heavy parts.

The P is as wide as the other letters, and its cross bar is sometimes placed at the center and sometimes below, but never above.

The R has the width of the other letters, its cross bar being usually placed at the center. The curves of this letter are peculiar, the tail being particularly difficult to master, and not easily described.

The S is also a peculiar letter, and the eye alone can be depended upon; a very handy way of drawing this letter is to make



Fig. 4.

the upper and lower circles, the lower one projecting beyond both ends of the upper one, and then finish the curves by the eye.

The T is as wide as it is high, sometimes wider. Its arms extend downward from the top lines a little less than the thickness of the letter. The V requires no particular remark.

The W is composed of two V's and requires considerable more space than the other letters.

The X occupies the usual space. The point where the hair-line intersects the middle part of the thick line should be above the center.

The Y takes more space than the ordinary letters. The point where the right and left angular lines intersect the upright line should be above the center.

The Z requires no particular remark excepting that the right-hand upper point and the left-hand point should never be sharper than the thickness of the hair line.

BURMESE VARNISH.

The well posted painter likes to know as much as possible about the medium he works in, be it varnish or paint. This information is not always of the kind that is classified as practical; but plenty of a workman's mental equipment that he finds useful, is not always headed practical.

This Burmese lacquer here spoken of is from an account we find in *The Decorator*, of which we reproduce only such part as we think may be interesting to the painter.

The principal constituent of Burmese lacquer, or "thitsi," is an oleo-resin, obtained from the "black varnish tree," which frequents open forests. The tree occurs in the native State of Manipur. It ascends to 3,000 feet elevation.

To obtain the varnish V-shaped incisions are made in the bark of the tree. The two sloping cuts forming the "V" are about nine inches in length and five inches apart at the upper end, meeting at the point of union at an acute angle. A bamboo collecting cup, about six inches in length, with a slanting mouth, is driven into the bark of the tree at the base of the incisions, and the exuding sap, a thick, viscid, greyish fluid is caught in the tube. After about ten days the exudation from the wound ceases, and the contents of the collecting cup are emptied into another vessel. A fresh slice is cut off the triangular piece of bark formed by the two sloping cuts, and the collecting cup is fixed higher up the tree near the new scarification. The sap continues to exude for another ten days, after which time the wound is abandoned. The tapping takes place all over the trunk of the tree and the principal branches; as many as 40 or 50 scars have been noted on one tree, some being at a height of 30 feet from the ground. The amount of varnish yielded varies considerably; old trees appear to produce more than young and vigorous specimens. The best time for tapping is from July to October. When the trees are leafless during the hot season they yield no sap. It is estimated that one collector can obtain from 40 to 50 viss (146-182 lb.) of varnish in a season.

The chemical composition of "thitsi" or Burmese varnish has recently been the subject of investigation. It appears that the most important constituent of "thitsi" is urushic acid, which forms about 85 per cent of pure samples, and that this and the other principal constituents are identical with those of Japanese lacquer. Further experiments proved that the moist atmospheric conditions essential in the hardening process of Japanese lacquer are also necessary in the case of "thitsi."

In Burma "thitsi" is used for a variety of purposes. In a liquid state it is often employed as a varnish on wood work, or utilized to render paper or cloth waterproof, as in the case in the manufacture of the characteristic Burmese umbrellas. Colored with vermilion, orpiment or indigo, it is used to ornament various articles of domestic or religious use. Ashes or teak sawdust are mixed with it to form a kind of putty, which is used on woodwork or basket ware to form a foundation on which finishing coats of varnish are afterwards laid.

WAGON PAINTING AS THE COLORIST SEES IT.

"I have never yet heard of a wagon painter attending an art school, but I am convinced that every wagon painter might do this with great advantage to himself and with great benefit to the community, for wagon painting as it is now done is as a rule not an art at all, but simply a painting job, says Mr. Miffleby in *The Sun*.

"Wagons are turned out often enough bright and glaring but as often wholly lacking in grace and beauty. What the painter would learn at the art school would be the science of colors and the science and art of colors complementary.

"Perhaps the commonest combination of colors seen in wagon painting is green and red, a green body and red running part, this being a combination that is proper and pleasing; and next comes, no doubt, the combination of red and yellow, a red body and a

yellow running part, this being also an agreeable color harmony, but when we depart from these two standard combinations we seem to get lost. We do see some fine wagons that are painted throughout in a solid dark color, with very sparing ornamentation, that are most satisfactorily pleasing to the eye, but when we come to painting wagons in colors other than the standard we seem oftenest to go astray.

"We see many wagons that are in some way distinctive, marked, and this is a clear advantage; such wagons, constantly seen in the streets, help to advertise the business in which they are used, but still we do not see many wagons that are really harmonious in their painting, of themselves pleasing. For instance, we may see a wagon with a body really artistically painted, perhaps with colors widely different, and yet so happily complementary that even the unskilled, though he may not know why, realizes when he sees it that this is good. But this wagon with the pleasing body may have its running part in a color that does not harmonize with it, and so the wagon goes about as a man might in clothes that were good but mismatched. The grand effect is not what it might be.

"Of course one trouble lies in the fact that everybody wants something different. Suppose a man is going to put on the street one or two wagons. He may buy these wagons completed, finished in a color that suits him and have them lettered, and then he puts them in commission, or he may have them painted to suit him and then when the wagons get dingy he sends them to the wagon painter to be repainted.

"The owner may have ideas of his own about the color, or he may defer to the painter, and they talk it over and finally decide that they'll paint the wagon red or maybe yellow or blue or green and then go ahead and paint her, perhaps all, body and running parts and all, in the selected color, relying on the lettering for ornamental effect. In this way we come to see some astonishing wagons, in strange tints of the colors selected and wagons in unusual colors producing effects that sometimes are not pleasing.

"It has always seemed to me that if I were going into a business in which wagons were required I should consult with an artist as to the wagon painting and I would not rest satisfied until I had found for these wagons a color scheme that was sound and good throughout, one that would make my wagons wherever seen not only distinctive in themselves, but objects completely pleasing to the eye, and if I were going into the wagon painting business I should first take a course in an art school. As I said at the outset, I truly believe that any wagon painter who should thus prepare himself would find in the practice of his acquired art a great advantage for himself and prove besides a benefactor to the community."

VARNISH MAKING IS A PROGRESSIVE ART.

The two new—distinctly new—and different grades of varnish that Valentine & Company announce in this issue come under the head of technical news, so far as it concerns the painter. Most of the talk of the writers on varnish and paints has been about auto finishing, and stress has been laid on the demand for neat finishing surfaces.

While the writers have been writing, the Valentine chemists and practical gum melters have been experimenting and producing and the result has been accomplishment of the hoped-for varnish that should do away with rubbing, yet produce the lusterless, durable surface finish the builder is demanding.

This achievement coming on the heels of the Vanadium Varnish of brilliant record, marks the art of varnish making a progressive one, with Valentine & Company very much in the spot light of progress.

The screws in machines exposed to heat and moist air soon rust in, even if oil is used, which makes the taking apart of the machine a very difficult task. By dipping the screws in a thin paste of graphite and oil, they can be removed.

PURE LINSEED OIL AND PAINT DURABILITY.

Paint durability within the past few years, especially, has come to be associated with the use of pure linseed oil, concerning the scarcity of which publications devoted to the interests of the oil trade have of late discussed exhaustively. Getting down to the crux of the matter it is a fact that in the last analysis paint durability, and of course, everything put on above the paint, depends something more than 90 per cent upon the purity and quality of the linseed oil used as the binding and elastic developing medium.

The cause of the sophistication of the linseed oil supply is not far to seek. It is not necessary to enter into a detailed explanation of how the oil shortage developed. Suffice it to say that the shortage is not only very real and very great, but there is apparently no relief in sight. As a result the price has soared to fairly unattainable heights, and acting in the wake of this movement the pious gentlemen in immaculate cloth are working the black magic of adulteration for all they are worth.

Users of wagons, carriages and automobiles were never more exacting than now in respect to the service which they demand the painting and finishing to give. It follows, therefore, that the painter, in taking an advanced step in favor of furnishing this increased durability, should first make his "call and election" sure by buying his oil supply from the manufacturer or jobber with an unquestioned reputation for handling honest and reliable goods.

Pure raw linseed oil as the basis—the very cornerstone, in fact—of strong, elastic, durable paint foundations remains unsurpassed. Its permanence, elasticity, its fairly remarkable property for making a pigment full of vital force and capacity for about everything demanded of it out in the world of work, is undisputed. By so much as this oil is adulterated, or "extended," to borrow a figure of speech from the rich and varied vocabulary of the adulterators, with an oil of less substance and vitality, by so much is its value decreased.

One of the promising adulterants is the soya bean oil, or, as it is otherwise known, Chinese bean oil. These beans or seeds from which the oil is extracted, are the fruit of plants indigenous to China, India and Japan. The soya bean oil in its native state is a pale amber color so closely approximating linseed oil in this particular as to deceive in many instances the very elect. In other particulars it resembles closely linseed oil. However, tests exhaustively carried out, prove the soya bean to be deficient in those qualities which have contributed to the popularity of linseed oil since the far-off days of Pharaoh. Used to the extent of 25 per cent in raw linseed oil it is fairly impossible for the average painter to discover the presence of the adulterant.

In addition to the soya bean oil, but to the painter less of a menace than the soya bean oil because they may be more easily detected, we have menhaden fish oil, hempseed oil, cottonseed oil, paraffin oils and resin oil. Fish, cottonseed and paraffin oils retard the drying of linseed oil for one thing; and quite as important, they render any oil to which they are added unreliable, both in working, drying and wearing qualities. While the paraffin oils are said to be among the most durable oils, it is almost, if not quite impossible, to get them to dry, hence their entire unfitness for use in extending the volume of raw linseed oil. Hence, also, the disastrous results due to ensue in buying and using an oil containing even an insignificant per cent of paraffin oils.

A final word: Buy of the reliable, trustworthy manufacturer or wholesaler. Pay the prevailing market price and demand a pure, raw linseed oil. Test it for purity. Reject it if spurious. Safeguard your work by accepting only pure linseed oil.

HICKORY PLANTING WILL BEGIN.

The Department of Agriculture announces through a circular which is just coming from the press, that it is ready to begin operations looking to the purchase of land by the National Forest Reservation Commission created under the Weeks Law.

MACHINE-MADE WAGON WHEELS.

The process of making wagon wheels in a large and highly organized factory is clearly described in *The Studebaker*, and is authentic. As the wheel is the mainstay of the wagon a critical account carries peculiar interest.

The most important thing in connection with a wagon is the wheels. If the wheels are not the best, no matter how good the rest of your wagon is, it will not stand up for any length of time.

We will first take up the hubs.

After the hubs have been thoroughly dried they are ready to be sealed, this being done to prevent checking. They are then mortised for the spokes.

This is done by a wonderful machine which eats into the wood as though it were cheese, making the mortise with one stroke. The hub is then ready to be banded.

One of the most interesting things to watch in this connection is the electric welding machine. The bands are heated to red heat in just two seconds. Think of it! Taking a piece of cold steel and heating it hot enough in two seconds to make a weld.

After the band has been heated it is welded together by a steam power hammer which only requires about three seconds more to do its work. The whole band is ready for the hub in just about eight seconds.

When the bands are ready they are put into a hydraulic pressing machine and the hub is put into this.

The first band that is put on is the band which is nearest to the spokes. This is called the spoke band. The same process is repeated for putting on the outside band or the point bands.

This completes the hub and it is now ready to have the spokes driven into it.

The first thing that is done with the spokes when they are taken from drying sheds is to tenon them. The machines for doing this are so set that they take off just enough of the wood to permit the spoke to enter the mortise in the hub, but not to fit too tightly.

This whole tenon is made in one cut of the machine.

After this tenon has been made, the next thing to do is to throat it, that is, diminishing the spoke about one and a half inches from the shoulder.

Now the spoke is ready to be driven into the hub. The hub is put on an axle first so that it may revolve freely. And now comes into play the wonderful power hammer, taking about three blows to drive the spoke into the hub.

After the spokes are all driven, the wheel is taken to a tenoning machine, the spokes being parallel with this surface.

In this machine the outer ends of the spokes are tenoned so that they will fit into the felloes. The wheel is now ready for the rim.

The wheels are again put in the rimming machine, this time horizontally, and the felloes, or rims, are pounded on with wooden mallets. We now have the whole wheel assembled and ready to be finished.

The first step in the finishing of the wheel is to face off one side. After this the tread is made at right angles to the side of the rim. The whole wheel is then revolved on an axle and sanded off perfectly smooth. We now see the complete wheel ready for the tire to be put on.

Of course the first thing is to make the tire. The strips of steel which are to be used for the tires are first put through a rolling machine (tire bender) which bends the steel into the shape of the tire as if it were chewing candy. It is then cut off to the desired length that the tire is to be made. The ends are then put into a furnace of great heat until they are hot enough to weld. When this heat is reached they are welded with an immense steam power hammer. The tire is then set. After the tire has been set it goes through every test possible in order that it will be perfect in every respect. We have the wheels now ready to be boxed.

The inside of the hub is smoothed out on a large lathe. It is

then laid on a steel base and the boxing is forced into the hub by hydraulic pressure. The wheel is now ready for the paint shop.

Into the paint shop the wheels are taken five or six at a time on a long steel axle. They are then given one coat of paint, and allowed to dry, then another. The wheels are now ready to be striped. The wheel is put onto another axle and set in motion. While it is revolving the painter takes his brush and holds it where he wants to make his line and the line is made perfectly. After the wheels have been striped they are carried out and varnished and allowed to dry and then varnished again. The wheel is then ready to go on the wagon.

OVERHEATING GLUE.

When glue is overheated and kept too long, it seems to lose its fibrous, stringy nature and become hard and brittle. Then when it gets dry, it flakes and breaks apart, and doesn't seem to have much holding power. The remedy for this is to be more careful in heating. The main object in heating glue is to get it so that it will flow, and both heat and moisture are used for this purpose. It is probably better to use more moisture and less heat to get the proper flow; at least it is imperative to guard against using too much heat. There is some difference of opinion as to just how much heat should be used in preparing glue, but the general belief to day is that the heat should be below the boiling point of water. It is probably better to err on the side of low temperature than on that of high, and to risk using a little more water to thin the glue, rather than to set it to boiling. Anyway, about nine times out of ten, when you find the work brittle and breaking apart easily in the joints, the trouble is overheated glue.

HOW TO HEAT TURPENTINE.

There are two methods of heating turpentine without danger. When an open pan is used it is made with a jacket—that is, there are two pans, an outer and an inner one, with a space between superheated steam from a boiler is passed into the space and is allowed to escape through a waste steam valve at the bottom; a safety valve at the side of the pan allows the steam to blow off if the temperature rises too high. Turpentine boils vigorously at a temperature of about 338 degrees F.—much higher than the boiling point of water—hence the steam at ordinary pressure would not cause turpentine to boil, says *The Modern Painter*. Turpentine can be heated to a boiling point over a burner or fire, provided it is contained in a still which is closed with the exception of one tube leading to a condensing coil kept cool by being placed in a tub, through which a current of cold water is caused to flow; any turpentine which may be vaporized is condensed in the worm and recovered, and no vapor can pass into the outer air.

A CHANCE TO SELL LIGHT WAGONS.

An American consulate in a Mediterranean country reports that a local business man requests to be placed in communication with American makers of light delivery wagons to be drawn by one or two horses. He has been in the United States and believes that the American type of delivery wagon is the best for that region, because it is lighter than those made in other countries, the grades in the country in question being steep render a heavy wagon useless. It is requested that prices be quoted if possible in British pounds sterling. If it is found impossible to quote prices c. i. f. port of destination, it is urged prices f. o. b. New York be submitted. The consul urges that manufacturers quote their lowest prices, because should the American type of wagon secure a foothold it will have practically no competition, as wagons made in England and on the Continent are too heavy. Too much care cannot be taken in the packing of the goods, as they are landed by lighters and in some cases must be transhipped. Correspondence may be in English.

HISTORY OF THE BABCOCKS.

The H. H. Babcock Company, manufacturers of carriages and automobiles at Watertown, N. Y., has one of the largest industries in that section. The plant covers 216,000 square feet of land and over 12 square acres of floor space and from 450 to 600 men are employed.

H. H. Babcock started business in 1845 building pumps and windmills in the old Massey stone tavern. The original tavern now forms the first two stories of the main building of the present plant.

A little later the four sons, Herbert, George, Frederick and Frank, became interested in the company, and the name was changed to H. H. Babcock & Sons. The business was successfully conducted until in 1882, when desiring to broaden the scope of their work and the times seeming propitious for the manufacture of buggies and carriages, there was formed the H. H. Babcock Buggy Company. The names of Governor Flower and Anson Flower were added to the company.

In 1909, the company having experimented for two or three years with an automobile that would satisfy the demands of the critical, it merged with the Watertown Carriage Company and incorporated under the name of the H. H. Babcock Company.

In addition to the 9,000 carriages now turned out by this plant yearly, 300 automobiles will be manufactured. The officers of the company are: President, G. H. Babcock; vice-president and general manager, W. J. Mills; secretary, W. R. Tasse; superintendent, F. G. Davis.

WAGON POLE STOCK.

Care must be exercised when selecting timber for poles. Special butts are put aside for this purpose. In season these butts are cut into tapered plank, and, after a further period of seasoning they are cut into poles, packed into fours or sixes, and an iron band put round each end to prevent, as much as possible, any warping, because the timber for this purpose is felled when only about half size, and is, consequently, very strong and tough. If left lying about, they would soon twist, warp, and become so out of shape that they would be useless for that purpose, says *Auto and Carriage Builders' Journal*. The lengths and sizes of poles vary according to the class of vehicle they are intended for. For heavy draught vehicles varying from three to four tons, the pole should be 9 ft. 6 in. long in front of the splinter bar, and should go under the forecarriage for a distance of 19 in., always fixing the hind pole socket as far back as possible. The size at the front socket should be $3\frac{1}{4}$ in. by $3\frac{1}{4}$ in. to $4\frac{1}{2}$ in. by $4\frac{1}{2}$ in. and the size at the hind socket $2\frac{1}{2}$ in. by $2\frac{1}{2}$ in. to 3 in. by 3 in. respectively, and these for one to three ton vans. Thus, assuming that the horses used are suitable for the load carried, the lengths of the poles in front of the splinter bars would be as follows: For one ton vans, 8 ft.; two ton, 8 ft. 6 in.; three ton, 9 ft., and in cases where cobs of about twelve hands are used, 7 ft. long would be sufficient. The sizes at the front and back sockets are as follows: One ton, at front $2\frac{3}{4}$ in. by $2\frac{3}{4}$ in., at back 2 in. by 2 in.; two ton, at front, 3 in. by 3 in., at back, $2\frac{1}{2}$ in. by $2\frac{1}{2}$ in.; $2\frac{1}{2}$ to 3 tons, at front, $3\frac{1}{4}$ in. by $3\frac{1}{4}$ in., at back, $2\frac{1}{2}$ in. by $2\frac{1}{2}$ in. The next important point to be studied is the height at point of pole, and this must be taken into consideration with the height of the horses, and should be as follows: Horses—17 and 18 hands, 52 in. high; 15 and 16 hands, 48 in. high; 13 and 14 hands, 44 in. high; 12 hands, 42 in. high.

The pole should be at first properly squared up and fitted to sockets, allowing for thickness of paint. A line should be struck directly down the center, and on the top of the pole, and then two other lines, each being $\frac{3}{4}$ -inch from edge and equally distanced from centre line. When tapering the back end, care should be taken in getting an equal taper on each side, so as to get the main body of the pole directly straight with the sockets. The pole can then be dressed up, the first pull in of shaving being 6 in. from the front socket, and should be 2 in. wide for a distance

of 6 in., and then to within $\frac{3}{4}$ -inch from the bottom edge. The side dressing should be oval in shape, not flat—the bottom edge is taken off, meeting the lower edges of side dressings, and $\frac{1}{2}$ -inch wide to bottom of pole, and then rounded over. The pole head can then be fitted, of which there is a great variety. Those used for heavy poles generally have a T, consisting of a flap about 10 in. long for bolting to the pole underneath, the side ears are $3\frac{1}{2}$ in. long from the center, a hole in each to take D shackle, and holes at each edge of the pole to receive screwed ends of cap, which goes over the end of the pole. The very small poles generally have a carriage socket head fitted, and then leather pole pieces are used. Pole chains with hooks are fixed to the heavy ones, being 2 ft. 4 in. long. Where patent kidney links are attached to collars, short chains only are required about 10 in. long. The pole pin hole should be bored immediately behind the splinter bar, $\frac{5}{8}$ -inch for the largest and $\frac{3}{8}$ -inch for the small ones, and fastened to a chain, which should be fixed so as to clear socket when hanging down. Poles that are fitted to the hind socket without having any shoulder cut must have a pole-stop screwed on just in front of the splinter bar, or they would get jammed in, and would be difficult to remove.

GERMAN THOROUGHNESS.

It is almost like a pin puncture, when we Yankees complacently consider our cleverness, to read a few kind words taken from an address to German manufacturers by Dr. Albert. The Germans are keen to note a good thing, and then improve upon it. These words of the kind doctor were uttered at a banquet:

Let me not forget just one other important secret of our success: It is our readiness to adopt from foreigners their methods of labor, whenever we find that they are better and more practical than our own, but at the same time to develop and improve them through our thoroughness in work, based on scientific investigation, and thus to outrival our original masters and models. I will mention only one branch of manufactures that was exhibited in the German section at Brussels, namely, machine tools. We all know how much we have learned from the Americans in this field, and that we are engaged in a very fierce competition with them. It is therefore of special interest to learn how this competition ended at Brussels, where the American exhibits were restricted almost exclusively to such machine tools only. The jury composed of experts, granted 10 grand prizes to Germany, 5 to Belgium, 4 to Great Britain, and only 2 to the Americans. I know no better proof than this to show that we are working in the right direction, nor can I urge a stronger reason for continuance in the same direction, with higher aims for the future, persistency improving this one of the most difficult, yet at the same time useful, of all mechanical contrivances.

THE MAJOR CAN'T TRAVEL.

Mr. G. W. Husted, for many years connected with a leading carriage manufacturer, has become identified with the Fairfield Rubber Co., and will in future represent the company on the road in place of Major, who met with an unfortunate accident atavenport, Iowa, last November. Though the trade will miss the genial major, we feel sure a welcome will be extended to any representative of the Fairfield Rubber Co.

TO TEST OIL.

A very simple test to detect acid in an oil is with blue litmus paper, which will show a pinkish color if there is any acid present. Another sensitive test, and a very practical one, is to partly cover a polished steel plate with a strip of flannel or lamp wick saturated with the lubricant to be tested. Expose this to the sunlight for about twenty-four hours. When the plate is wiped dry, if the lubricant is free from acid, the steel will have retained its gloss. If dull spots have developed on the surface covered, it is the sign of the presence of acid.

ENGINEERING ABSTRACTS.

The International Institute of Technical Bibliography is issuing in the "Abstracts" a monthly index of the world's technical press of unique value as a reference publication.

Not many years ago the Royal Society's Catalogue of Scientific Papers was handed over to the control of an International Council with regional bureaux, and to-day is chronicled a similar reorganization of The Poole of technical period literature, viz.—the Repertorium of the Imperial Patent Office of Berlin. This hardy annual has in its turn been transferred to an International Institute of Technical Bibliography, organized on lines similar to those of the International Council. The first step taken has been to transform the publication into a monthly, and to extend it by the inclusion of book notices. The index is published in six sections dealing respectively with mechanical, civil, electrical engineering, mining and metallurgy, applied chemistry, and matter not included in the preceding sections. A further section dealing with the naval, military and aeronautical sciences has also appeared recently. These monthly sectional indexes or "Abstracts" as they are termed, will be consolidated at the end of each year in one general alphabet. The first of these annual publications has appeared in two volumes. The classification of the deceased Repertorium was on dictionary principles; the title, headings, and index being in German, English and French, while the entries were compiled in the language of the articles indexed. The new publication follows closely on the old lines, except that the monthly sections have their headings arranged in class order, with a synopsis of the classification prefixed to each number.

Published monthly, in the seven sections. Subscription, 24 shillings per section, per annum. Address, The Secretary, International Institute of Technical Bibliography, 57-58 Chancery Lane, London, W. C.

NATIONAL IMPLEMENT AND VEHICLE PROJECT.

This is the illustration of the architectural design of the proposed big National Implement and Vehicle Show project to have its home at Peoria, Ill. It is a stock proposition and it has evolved much enthusiasm so far, locally.

The buildings are to be uniform in type, 80 feet wide and 900 feet long. Six rows of buildings of this type will be built, making an equivalent of nearly a mile of buildings, which will be thoroughly suitable for many civic purposes. The buildings will

be substantial and the architect's preliminary plans provide for such conveniences and adornment as to make it a thoroughly beautiful and attractive resort.

Preferred 6 per cent non-cumulative stock will be issued to all of the subscribers to the stock in this enterprise. It is further planned that the contracts with the exhibitors of agricultural implements and vehicles shall provide that after paying for the space at not to exceed 30 cents per square foot, they will receive a rebate or refund equal to 6 per cent upon the cost of said space, and all earnings in excess of 6 per cent to the stockholders and 6 per cent to the exhibitors on the cost of the space is to remain in the treasury as surplus funds to enlarge and extend the project from year to year, or may be used to provide a fund which may be used at the end of the ten years for the purchase of the land.

It is desired that work shall proceed as fast as possible in order that an exhibition may be ready the latter part of September or the first week in October of this year.

CINCINNATI CLUB ELECTION.

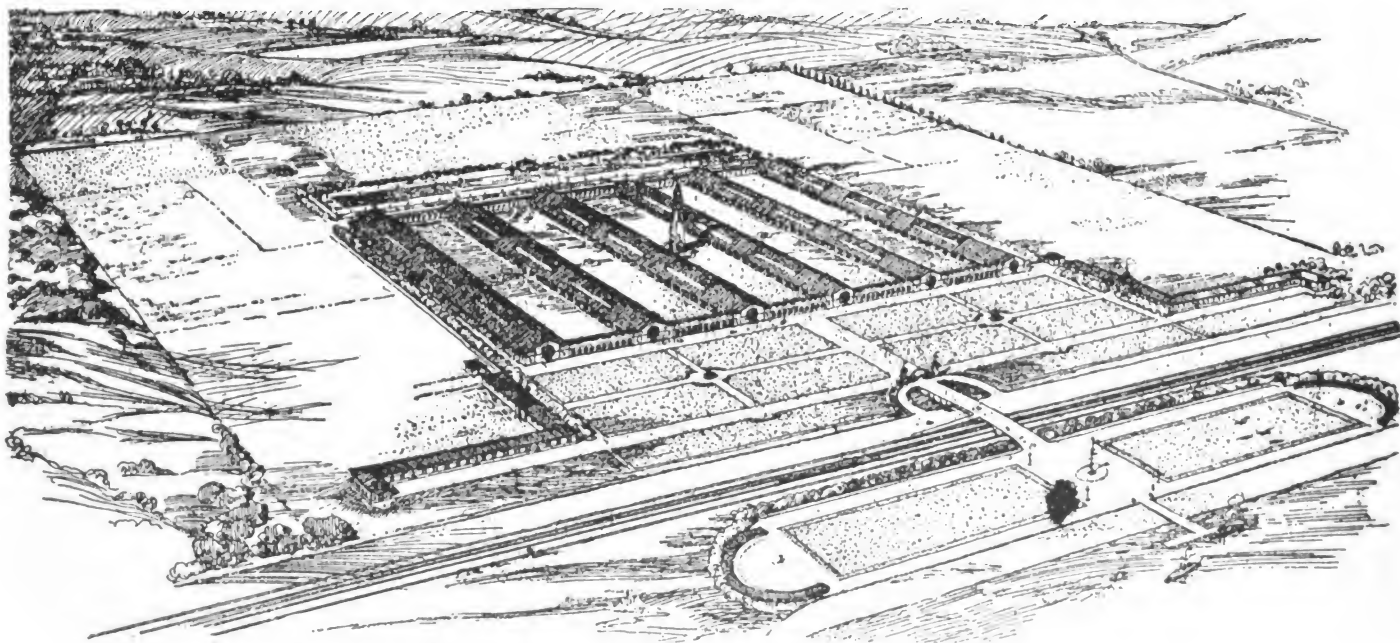
The annual election and banquet of the Cincinnati Carriage Makers' Club was held March 11 at the Grand Hotel. Candidates for the two and one-year terms for the board of governors being balloted upon. The election resulted in the selection of Fred Guckenberger, W. A. Sayers, James T. Taylor and W. H. Young for two-year terms, and C. B. Vandervoort for a one-year term to fill the unexpired term of David Gibson.

A demonstration in favor of abandoning the canal is being planned, according to Caleb Shipley.

The first speaker of the evening was Theodore Luth, who introduced C. A. Barnard of the Receivers' and Shippers' association. Barnard did not go extensively into the work of the association, but confined himself to reading letters from various firms congratulating the association on its notable victory in preventing the proposed increase in freight rates.

RECORD OF IRON AND STEEL MANUFACTURED IN 1910.

Two hundred million dollars worth of iron and steel manufactures were exported from the United States during 1910, a larger total in value than in any earlier year. The largest exportation prior to 1910 was 197 million dollars' worth in 1907, while in 1902 the total was but 98 million dollars' worth and in 1903, 96 million.



Design of National Implement and Vehicle Show Buildings.

GOODRICH TIRES—MOTOR CYCLES.

The Federation of American Motorcyclists is beginning to grow at a wonderful rate. The aim of the officers is to make the organization national. It is therefore desirable that a meeting place for this federation gathering shall be chosen which will be as near as possible to the Middle West, which is the center of motorcycle enthusiasm, and near enough to the East to attract the enthusiasts of that section, and also present the opportunity for combining the business of the convention with the opportunity for the annual summer vacation.

To meet such requirements, it has been proposed that the convention be held in Detroit, and the endurance run be from Buffalo to Detroit. For those coming from the west there is an opportunity to take a delightful boat trip from Toledo or Cleveland to Buffalo. On the return run, the route would be from Buffalo through Erie to Painesville, Ohio, then down to Akron. For the stop over night in Akron the local club, which, by the way, is a club that is well organized and equipped to entertain, would look out for the riders. The B. F. Goodrich Company has just completed a large and splendidly arranged garage.

The next day the riders would go to Columbus via Zanesville and the third day from Columbus to Toledo and then into Detroit.

Much can be said on behalf of this route from the viewpoint of benefit of the sport and the industry.

The B. F. Goodrich Company has carefully posted the route from Buffalo to Cleveland and then to Akron with road markers. The rest of the way to Zanesville, Columbus, Toledo and Detroit will be thoroughly marked by the time the F. A. M. is in session.

AN AUXILIARY TIRE.

We have seen illustrations of an auxiliary tire of English design described by Commercial Motor, that appears sensible.

On the inside of the usual inflated wheel's rim is a small pressed steel rim fastened to the felloe, and on it is applied a solid rubber tire. The aim is to do away with carrying extra tires or complete extra wheels as emergency fixtures.

The outer diameter of each small assistant tire is approximately 3 in. less than that of the fully inflated pneumatic tire belonging to the wheel to which the auxiliary rim is attached. This difference in dimensions gives ample clearance from the ground when the pneumatic tire is fully inflated. Directly the latter becomes deflated to any noticeable extent, the small solid tire comes into contact with the ground and assumes the functions that are normally performed by the main road wheel. What is of importance is that it is impossible for a driver knowingly to run on a deflated tire, to the extensive damage of both cover and tube, as is so often the case when ordinary pneumatics are in use solely.

The inner position of the auxiliary solid tire reduces the range of lock of the steering wheels, and that circumstance will require careful consideration.

NEW WHEEL COMPANY IN DETROIT.

The Detroit Wheel Co., a million dollar corporation, has filed articles of incorporation. The company proposes to manufacture vehicles of all kinds. The bulk of the stock is held by Charles R. Chisholm, the other shareholders being Noah H. Smith and Raymond T. Sewall, of Boston, and A. W. Weir and Frederick A. Spitzer, of Detroit.

TRACTION TRAIN.

The Studebaker Corporation is preparing for shipment to Tampa, Florida, six wagons which are to be used in a traction train on a large tract of land which Mrs. Potter Palmer and her son are opening.

"CONCENTRATE."

Of all the "guff" that floats on the surface of heaps of this alleged purpose-talk, we think the aphorisms, the tabloid wisdom, the concentrated balderdash of the professional jaw-smiths is the most inert, yet every little space corner in class journals is full of this stuff a la Ben Franklin. If it were amusing enough to put it into a composite wisdom-dose and administer it to the studious six-per-week clerk for whom it seems to be indicated, as the doctors say, it would make that unhappy wight go round like a jagged pin-wheel at the conclusion of a fireworks show.

However, one W. J. C., in *The Organizer*, whatever that is, has a few good thoughts and he heads them as above. They do offer a working hypothesis for some good thought:

"What work is there that matters more than anything else to you? If it is worth doing, it is worth doing better than it has ever been done before—for your sake.

"The greatest temptation most of us have to resist, more especially the man of energy and ideas, is to leave the main issue and dissipate our efforts on the attractive by-paths that don't count.

"Separate the main purpose from every other interest you may have; it is likely you cannot neglect the other interests, but look on that work as a thing apart.

"Be clear as to what is most important; learn the surest way to your goal and go direct.

* * *

"However ordinary your job may be; it is possible to make it an extraordinary success; this will bring interest to the most humdrum occupation and distinction to you.

"Think, scheme, plan to find better ways of doing the old work—that is how success is won. Nearly every new job is an old job done differently.

"The man makes the job; what is an unimportant position or business in one man's hands becomes paramount in the hands of another.

* * *

"Some men are so small they don't know when they are in a rut.

"Other men are so big you can keep them in a rut.

"The chief trouble is with those who got in a rut when they were small and now want to get out.

"If they will only do their present work better than it ever has been done before—introduce new methods and new thought—they will burst the rut, there won't be one any more.

"Every occupation offers opportunity—dig it out, and then when you have got your job under and can hold it down properly, get a bigger one.

"The battle is won by concentrating on the immediate thing that matters."

THE SIX CYLINDER.

The six-cylinder engine is making headway in France, particularly in small sizes, but the two and three-cylinder engines are scarcely favored. In England the two-cylindered engine still has a vogue, the difficulty of irregular carburation having been overcome in two or three ways. Neither can it be said that there is any evidence of any serious attempt to create a demand for single-cylindered, low-powered voiturettes. The demand must be created, just as the demand for the motor bicycle has been created by the enterprise and persistence of the manufacturers, who have produced machines that are irresistible, thus attracting buyers.

CANADIAN HARDWOODS.

The production of hardwoods in Canada, in view of probable reciprocal trade in timber may have its interest for carriage and wagon builders. Birch was cut to the value of \$18.08 per 1000 feet in 1909; basswood, \$19.08; elm, \$17.09; ash, \$18.42; poplar, \$13.57; oak, \$29.97, and hickory, \$26.47.

SHAFTING.

Materials commonly used in making shafting are wrought iron and steel, though in some cases where the shaft is short and well supported, such as jack shafts, cast iron is employed. Originally shafts were made of wood, but to-day these are rare.

The choice between iron and steel lies largely with the engineer, though for shafting transmitting a small amount of power wrought iron is almost invariably used, as the diameter of a steel shaft would be so small that it would become impractical, owing to the increased number of supports needed, or if the diameter be increased beyond that necessary to carry the required power its cost would be increased so much more than wrought iron that it would become impractical from this standpoint. At the other extreme, that is, where a great amount of power is to be transmitted, steel shafting is employed as its diameter and weight will be considerably less than that of wrought iron for the same power transmitted. These considerations, set forth by Practical Engineer, are of importance in the wood working, as well as the smith shop.

Strains to which a shaft is subjected come under two heads. These are the twisting and bending strains. The principal strain of course, is that due to the twisting action of the pulley, and a study of its action in detail is essential in order that we may get a clear conception of what is actually taking place within the fibers of the shafting and thus be able to determine the power which the shaft is able to transmit.

The resisting moment of a unit area of the shaft is proportional to its distance from the center, and by mathematical calculation it has been shown that for round shafts the total resisting moment becomes 3.1416 times the shearing strength of the material used, times the cube of the diameter, divided by 16. By means of this rule we are then able to determine the power which the shaft will transmit, knowing the radius of the pulley and the shaft diameter, the shearing strength of steel being 75,000 lb. to the square inch, of wrought iron 50,000, and of cast iron 25,000. Furthermore, if we know the speed of the shaft we are able to determine the horsepower transmitted by multiplying the pull in pounds by the speed of the belt in feet per minute, and dividing the product by 33,000.

The rule above gives the breaking strength of the shaft, for we took the ultimate shearing strength of the material used in the shaft, so for our purposes it is necessary to use a shearing strength considerably less in order to get a safe working strain. This for steel is taken as 12,000 lb., for wrought iron 8,000, and for cast iron 4,000.

Taking these factors into consideration, in the above rule, we find the diameter of the shaft by dividing the horsepower to be transmitted by the revolutions per minute, extracting the cube root and multiply by 2.984 for steel; for iron multiply by 3.422, and for cast iron by 4.297.

By an analysis of the strains which take place within a shaft, it will be noted that, since the moment of force which a given area of the shaft is able to transmit varies as its distance from the center, the actual material employed in the shaft can be made less and still transmit the same amount of power by making the shaft hollow. By a comparison of the solid and the hollow shafts it has been demonstrated that they will be of equal strength when the difference between the fourth powers of the outside and inside diameters divided by the outside diameter of the hollow shaft is equal to the cube of the diameter of the solid shaft.

There are certain advantages to be had by the use of hollow shafts in that their weight is considerably less, and for this reason, and also that the bending strength is considerably decreased owing to the increased diameter, the bearing or the supports can be placed further apart. Where the power is great a hollow shaft becomes so large that the bearings become abnormally large and over expensive.

The proper distance between bearings or supports of a shaft is governed by the deflection which should never exceed 0.01 in. per foot of length. This in turn is dependent upon the weight or

diameter of the shaft, the material of which it is made, and the location of the pulleys with reference to the bearings. The general rule for line shafts is to place the bearings 8 ft. apart. Expressed as a rule where shafting is used for transmission alone, the distance between bearings is taken as the cube root of the product of 720 times the diameter squared. Where the shaft carries a number of pulleys placed at various points between bearings, the distance is equal to the cube root of (140 times the diameter squared).

The character of the work to be performed by a line shaft determines almost entirely the speed at which it should be driven. Another factor entering into the choice of speed is the speed of the main driver and the diameter of the main driven pulley.

For machine shops the speed most generally employed ranges between 120 and 180 r.p.m. In wood working shops this is increased from 250 to 300 r.p.m.

While it is less expensive to install a plant with line shafting running at high speed, owing to the decreased cost of shafting, belts, pulleys, etc., the cost of maintenance is increased considerably owing to the increased wear upon the bearings, the vibration of the shaft tends to destroy its alinement, and the general wear and tear of the whole system increases.

Where it is found desirable to extend a shaft or in cases where the shafting runs the entire length of the room without sufficient space at the end to remove pulleys, clutches, and the like, some form of coupling is a convenience well worth employing.

Plate couplings are used for heavy shafts and consist of two parts, each keyed to the end of a shaft with the flanges bolted together. The thickness of the hub equals 1-3 the diameter plus 0.25 in. the same as for the muff coupling, and the length of the hub equals 4 times the thickness, this being for each half of the coupling. The halves are either forced or keyed to the shaft before it is put into place, and after alinement has been made the plates are bolted together. The number of bolts employed equals 0.8 times the diameter of the shaft plus 2.

Forged flange couplings are made by upsetting the end of the shaft so as to form a disk at the end whose diameter, according to Seaton, is equal to 1.6 times the diameter of the shaft plus 2.25 times the diameter of the bolt used. The diameter of the bolt circle equals 1.6 times the diameter of the shaft and thickness of each flange equals 0.3 times the diameter of the shaft.

Clutch couplings are employed where it is desirable to disengage one section of the shafting from the other.

The installation of a coupling upon a line shaft requires the utmost care to see that the shaft is in perfect alinement or trouble is sure to follow. There is considerable danger connected with the use of couplings in that there are frequently projecting points such as bolt heads, nuts and so forth, which are liable to catch upon belts, thus causing the belt to be ruined, or the alinement of the shaft to be destroyed, as well as other serious consequences.

In order to keep pulleys, couplings, or clutches from turning on a shaft either set screws or keys are employed. The holding power of set screws is so small in comparison to keys that in nearly all cases of line shafts or head shafts keys are employed in preference to set screws.

DOYLE PRESIDENT.

The implement and carriage dealers of Genesee County, Mich., have formed an organization that will be known as the Genesee County Implement and Vehicle Dealers Association. The officers are: President, M. C. Doyle, Clio; secretary-treasurer, B. C. George, Flint. The association will be affiliated with the state association. William Goodes, of Flint, president of the State association, was instrumental in the organization of the local association, which has for its purpose the promotion of a closer working unity among the men engaged in the vehicle and carriage business.

It does not require skill at key fitting to get satisfactory adjustment and service out of a split pulley. All it needs is care in putting the pulley on and tightening up the bolts.

EXTERIOR FINISH.

The materials of which the exterior parts of motor carriages are constructed vary very considerably; but whatever their nature they all require protection from the effects of the weather. Sometimes the bodywork of cars has been finished off with sheet metal panels and mouldings entirely, and carefully polished and then coated with fine varnish. Various examples of this style of work have been exhibited from time to time and have been put into use, and there are many who have a preference for bodies finished in this manner. The majority of motorists, however, prefer their cars to be painted in some color and finished in the manner similar to an ordinary carriage. This mode of finishing the car affords a very wide scope for the exercise of the individual taste of the builder and the owner of the car. This cannot be freely exercised without judgment on the part of both, and the consideration of a few of the points which go to make up the character of the object to be treated decoratively may not be out of place.

Decorative design, when executed in colors, is generally applied to a flat surface. When the surface is on one plane it may be divided and treated with regard to the decorative effect of the divisions or the relief from the plane surface. Frequently the object is large, such as the surface of a wall or ceiling, and the divisions are arranged symmetrically and relief given by pillars, pilasters, carving and decorative plaster work generally, so arranged that the plane surfaces are retained, but in diminished sizes, and the decorative work in colors, while being distinct in each separate part, is in harmony when considered as a whole.

The form of the motor carriage is unlike that of any other thing, for it is not composed of plane surfaces or even entirely of curved and rounded surfaces, but of a combination of plane surfaces and curves, with some parts of a very distinctive character, which may be detailed.

The present fashionable motor carriage, the flush-sided cabriolet, may be taken as a fair example of the form of a motor carriage suitable for illustration of decorative effect, says *The Motor*. Here there is neither a plane surface nor one which is entirely rounded, but there is a combination of the rounded form with straight lines and decided circles and curves. These cannot be dispensed with or altered. The wheels, with their large masses of circular form, the pneumatic tires, dominate the design, the curved mudguards may be slightly varied, but the straight lines of the step board and the chassis frame remain, and with them the fixed and rigid lines of the bonnet and radiator, whether in front or in the rear of the engine. The body lines are a combination of horizontal and perpendicular lines and curves with a recessed part below. The upper half is generally composed of black leather and glass in about equal proportions, and over all this there are lines and spots of bright metal work.

Here a consideration of the subject will show that the ordinary laws of decorating will not apply, for the artist has not entire freedom in the choice of form or division, and there are considerations of the effect of special materials, such as the color of the rubber tires, the leather, and the glass, necessary parts fulfilling special functions, which cannot be discharged by any other materials, which have to be considered when devising a scheme for the color decoration of a motor carriage.

The lines of the chassis, the bonnet, and the position of the wheels are all determined by the engineer-designer without reference to the shape or position of the bodywork which is to be placed upon it. The body is designed to carry the number of passengers, decided upon by the owner, and the general outline is settled by him; and then the question of the color scheme is settled frequently without any idea of the many items which introduce color and form into the composition of the completed design.

Take the question of the material with which the hood is to be covered—enamel leather in color or a waterproof material. The leather is either bright black, aluminum or grey. The woven material a dull black, very dark grey or brownish shade, and this is a solid mass on one part of the carriage, unrelieved by any touch

of color, unless the ironwork, by means of which the hood is attached to the body, is coated with either brass or nickel instead of being black enamelled. A large square of glass is placed in the center of the design, and this cannot be altered very greatly in form, for it has to be disposed of conveniently within the door. A large glass divides the front from the rear portion, and there is the windscreen in front with its polished wood and bright metal work.

The lines of the body have to enclose the passengers, and if there are seats provided for six, and the owner driver prefers the low, well-inclined steering wheel position, this will throw the rear portion of the body a few inches further back and alter the balance of the design, for the portion behind the front seat has to be of a certain size, while that portion which is available for the door space is fixed, and the door may have to be so made that it can open so that there may be only a small space to accommodate the glass frame and glass. This frequently makes the rear portion of a flush-sided cabriolet body appear to be very heavy, and when there is a black leather hood out of all proportion to the size of the rest of the carriage, this heaviness is apparently accentuated by the position of the rear wheel and the mudguard.

The width of the chassis frame is much less than that necessary for the requisite seating accommodation, and, consequently, the lower part of the body is turned inwards towards the framing. The long step-boards have to be so placed that they are convenient for the passengers to step up to assist them in their entry and egress; generally the front edge is in line with the axle caps. It will be seen that here the artist has not a simple problem of decorative color-scheme on a plane surface with no reflected lights to deal with. There is not merely the irregular surface, but there are the bright-polished metals and highly varnished panels to reflect parts and the rounded curves to present their high lights to the spectator. Added to this, there are the additions of various shaped lamps and warning horns, spare wheels, boxes and cases necessary to be carried, all contributing their quota of color and light as well as form to the general design.

DESCRIPTION OF SMALL CAR THAT MAY INTEREST BUILDERS.

With the growing popularity of the small four-cylinder engine the single cylinder model has had to move back to smaller and smaller sizes, notwithstanding the wonderful improvements that have been made in the "one lugger." This change in policy is more pronounced in France than elsewhere, for a few specialists, have brought the single cylinder car to its highest development, and found the greatest favor owing to low initial cost and moderate up-keep.

The car is designed throughout with a view to keeping the weight down to 7½ cwt. all complete, its single cylinder motor of 90 mm. by 120 mm. bore and stroke gives ample power. Its makers claim that with full equipment and two up it will travel 30 miles an hour on the level, while averaging over 40 miles on one gallon of gasoline.

Both the motor and the transmission gear are carried on a sub-frame which is practically a reduction of the main chassis. The reason for this substantial sub-frame is that the transmission is by means of friction, with final drive by a single chain. In view of the light weight of the chassis and the very substantial mounting of the countershaft on the sub-frame, there appears to be no reason why this arrangement should not give satisfaction for very long periods. The makers claim that the fibre with which the driven pulley is faced will last for 1,000 miles and can be readily replaced at a cost of \$5.

At least two important French firms, having obtained a reputation for cars of high power, have been considering the production in large series of a light, single-cylinder friction driven car. There are certain features in the drive which it is believed will give greater efficiency than ever before obtained under the friction system, while at the same time providing even greater simplicity.

RECENTLY GRANTED PATENTS OF INTEREST TO THE VEHICLE INDUSTRY.

- 968,229—Turn Table. Jean M. Baker, Los Angeles, Cal.
 968,446—Tire-Fastening Device. Richard S. Bryant, Columbus, assignor to the United Rim Company, Akron, Ohio.
 968,447—Driving Gear for Vehicles. Edgar Byars, Amarillo, Texas.
 968,510—Vehicle Seat. Louis S. Clarke, Haverford, and B. B. Bachman, Philadelphia, assignors to Autocar Company, Ardmore, Pa.
 968,511—Dumping Wagon. Wilbur L. Collins, assignor to E. L. and J. W. Montague, J. K. Wright, Baldwinsville, L. N. Ostrander and A. D. Merry, Phoenix, N. Y.
 967,887—Resilient Wheel. James G. Daw, Wellfield, Llanelly, England.
 968,337—Vehicle Wheel. Luke G. Fleming, Tarrytown, N. Y.
 968,145—Axle Lubricator. John F. Gross, Canton, Ohio.
 968,335—Propulsion Vehicle. Wm. and H. Hopkins, Oakland, Cal.
 967,931—Motor Attachment for Vehicles. Watt S. Jones, Baxter Springs, Kas.
 967,937—Wagon. Michael Kraeski, Howard County, Md.
 968,184—Tire Protector. Daniel D. Murray, assignor of one-eighth to N. S. Stalker, Duluth, Minn.
 968,392—Wheel. Wm. W. Neighbour, Denison, Texas, assignor to Suspension Ball Bearing Manufacturing Company, New York, N. Y.
 968,069—Tire. Louis M. Nelson, Pennington, N. J., assignor to Nelson Tire Company.
 968,259—Anti-Vibration Device for Vehicles. Wm. A. and C. L. Penfield, Meriden, Conn.
 967,970—Dumping Vehicle. Alexander R. Piper, Brooklyn, N. Y.
 968,193—Vehicle Stop. Sebastian Ranley and J. A. Schlirack, St. Henry Ohio.
 968,414—Anti-Skidding and Traction Device for Automobiles and other wheels. William Reagan, Philadelphia, Pa.
 968,419—Combination Wagon and Car. David F. Reinheimer, New Paris, Ohio.
 967,979—Tire Protector. Wm. E. Sampson, Grand Island, Neb.
 968,086—Tire Armor. Frits H. Schulenberg, Dunkirk, N. Y.
 968,303—Steering Device for Vehicles. Otto Winkler, Kopenick, Germany, assignor to General Electric Company.
 969,084—Steering Indicator. Samuel I. Address, Mackinac Island, Mich.
 968,914—Traction Device for Motor Vehicles. Truman J. Andrews, Beridji, Minn.
 968,519—Change-Speed Mechanism. Johann F. Appinger, assignor to Automobilwerke Union Aktiengesellschaft, Nuremberg, Germany.
 968,521—Driving Gear for Motor Vehicles. Walter Baird, Pittsburg, Kansas.
 969,024—Automobile Wheel. Frank D. Baker, Corsica, Ohio.
 968,637—Wind Shield. Arthur L. Banker, Pittsburg, Pa.
 968,750—Draft Attachment for Vehicles. Charles R. Barr, Ashland, O.
 968,527—Buggy Top Attachment. Emilus C. F. Becker, Milledgeville, Georgia.
 968,643—Spring Wheel. Willard Brown, Belfast, Maine.
 968,750—Controller for Motor Vehicles. George W. Dunham, assignor to Olds Motor Works, Lansing Mich.
 968,751—Anti-skidding Chain. James I. Edgerton, New York, N. Y.
 13,148—Re-issue—Hanger for Shock-Absorbers. Ernst Flentje, Cambridge, Mass.
 969,140—Driving Mechanism for Motor Vehicles. Alfred B. Fowler, Central Falls, R. I., assignor of one-half to B. Phillips, Boston, Mass.
 969,052—Shock Absorber. Albert M. Gray, Roanoke, Va.
 968,941—Vehicle Tire. James E. Harrison, New York, N. Y.
 968,849—Change-Speed Mechanism. Lindley D. Hubbell, assignor to the Pope Manufacturing Company, Hartford, Conn.
 969,107—Radiating Mechanism for Automobiles. Forrest M. Keeton, Massillon, Ohio, assignor to Keeton Securities Company, New York.
 969,063—Truss Rod for Buggy Tongue Circles. Anton J. Kremlacek, Howells, Neb.
 968,777—Automobile Tire. Charles A. Lieb, New York, N. Y.
 968,867—Vehicle Brake. Ludger Mignault, deceased, Hallowell, Maine. C. A. Mignault, executrix.
 968,880—Demountable Tire Rim. Adam Paul, assignor to Adlerwerke Vorm. Heinrich Kleyer Aktiengesellschaft, Frankfurt-on-the-Main, Germany.
 969,116—Anti-skidding device. Augustus Pflueger, New York, N. Y.
 969,077—Cushion Tire. Thomas Purcell, Roanoke, Va.
 968,800—Automobile Fender. John P. Randerson, Albany, N. Y.
 968,980—Non-Puncturable Tire. Charles R. Rawdon, St. Louis, Mo.
 969,080—Vehicle Running Gear. Edwin Roblin, Lansing, Michigan.
 968,703—Whiffetree Hanger. John I. Shaw, Novinger, Mo.
 968,705—Running Gear for Bob-Sleds. Oscar C. Simonson, Waukon, Ia.
 968,706—Tire Protector and Tread Grip. Albert C. Smith and S. W. Smith, Albion, Ill.
 968,894—Folding Top for Vehicles. Joseph Teppert, Buffalo, N. Y.
 969,082—Dump Wagon. Adam Woerber, Denver, Colo.
 968,627—Steering Mechanism. John H. Young, Haskell, Okla.
 968,911—Wheel Bearing. Harry B. Zerr Wawawal, Wash.
 969,241—Vehicle Wheel. Tom W. Baker, London, England.
 969,445—Vehicle Lamp. Horace W. Beebe, New Haven, Conn.
 969,744—Anti-Skidding Protector. George W. Bierer, Pittsburg, Pa.
 969,593—Auto Wheel. Alonzo L. Bialock, Madison, Fla.
 969,696—Cushion Wheel. Robert E. Boring, Carlisle, Ill.
 969,463—Dumping Wagon. Hallett D. Ellis, Kansas City, Mo.
 969,258—Dumping Wagon. Hallett D. Ellis, assignor of one-fourth to H. M. Godard, Kansas City, Mo.
 969,266—Resilient Vehicle Wheel. Joseph Gaynor, New York, N. Y.
 969,629—Whiffetree. Davis Hurd, Niagara Falls, N. Y.
 969,536—Vehicle Wheel. John Illingworth, Newark, N. J.
 969,293—Vehicle Body. Samuel E. Light, assignor to W. H. McCurdy and J. D. Craft, Evansville, Ind.
 969,645—Draft Appliance for Vehicles. Wm. P. Maxwell, Unity, Pa.
 969,389—Auto Tire. Frank Modlin, Sioux City, Iowa.
 969,717—Tire. Louis M. Nelson, Pennington, N. J., assignor to Nelson Tire Company.
 969,396—Vehicle Tire Locking Device. Albert Packard, assignor of one-half to F. J. Mack, Indianapolis, Ind.
 969,722—Detachable Automobile Tire Tread. Harry M. Pitman, Oakland, Cal.
 969,562—Draft Gear. Henry F. Pope, assignor to the National Malleable Casting Company, Cleveland, Ohio.
 969,416—Adjustable Rim and Tire. Harry C. Smith, Ainsworth, Neb.
 969,668—Fifth Wheel. Robert S. Speer, Sedgwick, Kas.
 969,304—Elastic Wheel. Jacobus Spyker, Amsterdam, Netherlands.
 969,218—Wagon Standard. Arthur D. Stierhelm, Charlestown, Ind.
 969,673—Wheel. Edwin E. Thomas, Portland, Oregon.
 969,425—Anti-Skidding Device for Wheel Tires. Philip C. Traver, Far Rockaway, N. Y., assignor to Pearsall Traver Manufacturing Co.
 969,426—Anti-Skidding Device Coupling. Philip C. Traver, Far Rockaway, N. Y., assignor to Pearsall-Traver Manufacturing Co.
 970,008—Automobile Sled. Orla A. Arnet, Woodland, Mich.
 970,291—Rim Bearing Wheel. Edward J. Baisden, Topeka, Kas.
 969,766—Steering Device for Vehicles. Arthur D. Baker, South Bend, Indiana.
 970,297—Automobile Radiator. Charles C. Boeck, assignor to Novelty Manufacturing Company, Jackson, Mich.
 969,937—Thill Coupling. Raymond Coates, assignor of one-half to J. H. Antis, Jackson, Mich.
 969,772—System and Apparatus for Propelling Vehicles by Compressed Air. Julius O. Cobb, Milwaukee, Wis.
 970,309—Automobile Fender. Glenn E. Coney, assignor to Metal Stamping Company, Jackson, Mich.
 970,436—Wagon. Albert D. Ellsworth, Broad Brook, Conn.
 970,437—Mail Wagon. George A. Flinn, assignor of one-half to C. Lochner, Fort Wayne, Ind.
 969,779—Vehicle Wheel Rim. John R. Gammeter, assignor, by mesne assignments, to the United Rim Company, Akron, Ohio.
 970,324—Sled Knee. George J. Goddin and H. B. Evans, Elkins, W. Va.
 970,329—Tire Inflator. Wm. R. Heck, assignor of one-half to A. F. Heck, Palmer, Neb.
 970,229—Resilient Wheel. Winfield S. Houser, assignor of one-half to W. B. Brown, Dubois, Pa.
 970,238—Vehicle Body. Davis J. Kerstetter, Green Ridge, Mo.
 970,244—Automatic Tongue. Frank Y. Lauterbur, Sidney, Ohio.
 969,888—Wheel and Tire. John C. Lighthouse, Rochester, N. Y.
 969,889—Sectional Wheel. John C. Lighthouse, Rochester, N. Y.
 970,254—Wagon Tongue Yoke Attaching Device. Frederick G. Mitchell, Glencoe, Md.
 970,081—Pole Tip. Lewis L. Moore, Canton, Ohio.
 969,899—Protector for Automobiles, etc. Susan C. Partington, Buffalo, N. Y.
 970,390—Shock Absorber for Automobiles. Christian A. Petersen, Laconia, N. H.
 969,908—Pneumatic Tire Protector. Edwin Russell, Kansas City, Kas.
 970,354—Automobile Sled Attachment. Wm. E. Ryan, Mason, Nev.
 970,126—Vehicle Wheel. Harry Scullin, St. Louis, Mo.
 969,990—Speed Indicator for Motor Cars and other Vehicles. Cuthbert C. Smith, Twickenham, England.
 970,135—Storm Curtain. Isaac L. Taylor, Goltry, Okla.
 970,005—Demountable Tire. Valentine Wildner, Chicago, Ill.
 969,923—Four-Horse Equalizer. Christian F. Wille, West Alton, Mo.
 970,285—Thill Support. Forrest B. Williams, Columbus, N. C.
 969,829—Vehicle Rim. Martin L. Williams, South Bend, Ind.
 969,930—Detachable Vehicle Rim. Martin L. Williams, South Bend, Indiana.
 40,878—Design. Wagon Body. Dad Boyle, Amarillo, Texas.

Copies of above patents may be obtained for fifteen cents each by addressing John A. Saul, solicitor of patents, Fendall Building, Washington, D. C.

HORSE SHOW DATES.

- Atlantic City, April 19-22.
 Canadian National, Toronto, April 25-29.
 Brooklyn, April 25, 26, 27, 28.
 Vancouver, B. C., April 25-29.
 Boston, April 24-29.
 Ottawa, Canada, May 2-6.
 Newark, N. J., May 4-6.
 Montreal, Canada, May 9-13.
 Va. H. S. and Race Meet, Richmond, Va., May 20-22.
 Keswick, Va., May 24.
 Devon, Pa., May 29-June 3.
 Leesburg, Va., June 7, 8.
 Plainfield, N. J., June 8, 9, 10.
 Upperville, Va., June 14, 15.
 Springfield, Ohio, June 20-22.
 International, London, June 12-14.
 Columbus, O., June 27-29.
 Culpepper, Va., July 4, 5.
 Manassas, July 26, 27.
 Long Branch, July 26-29.
 Orange, Va., August 2, 3.
 Charlottesville, Aug. 9, 10.
 Cobourg, Canada, August 15-18.
 Front Royal, Va., August 15, 16.
 Bar Harbor, Me., August 22-24.
 Berryville, August 22-24.
 Warrenton, August 30, 31.
 Newport, September 4-6.
 N. Y. State Fair Horse Show, Syracuse. September 11-16.
 Bryn Mawr, September 27-30.
 Mineola, L. I. September 28-30.
 Brockton, Mass, October 3-6.
 National, November 18-25.

HOW STANDARDIZATION AIDS THE INDUSTRY

"That standardization is a good thing is realized by many, but the necessity of it would be realized by many more if the situation were fully understood," says Coker F. Clarkson, general manager of the Society of Automobile Engineers, in a paper dealing with the subject. "For example, it is not clear to many of the business men associated with the automobile industry that there is any unnecessary complication of design. They do not realize that there are three or four hundred more dimensions and designs for lock-washers between the sizes of 3-16 inch and $\frac{1}{2}$ inch than there ought to be. It is hard for the business man to see why any such situation should arise unless there existed some necessity for it. The explanation is clear.

"A draftsman is called upon to make a drawing of an automobile axle, for example, capable of carrying a car of some given weight and that, in a general way, it should be an I-beam axle of certain length and style. Entering into this axle are very many details as to size of hole for spring clips, pins for steering joints, etc., to accommodate the rest of the steering mechanism and permit the whole thing to slip into a car properly. The draftsman exercises his own judgment as to these details, not having before him any standard for various details. For instance, he may choose a tubing for the steering cross rod that does not exist in stock. If he has no table of tubing sizes before him he makes it to suit his fancy so long as it will do the work. He will do the same thing for the shape of the heads of the screws and bolts and for the size of the holes for the spring clips and for many other details. Every one of these things he may select, to suit his fancy, may not exist in stock, may not even be of standard design.

"The drawing will go to the checker and, if the figures correspond and the design be a good looking one, it goes to the purchasing department and the parts are ordered. The next thing that may happen is that the screws ordered are found to be special and the screw company furnishing them so states and says 'Can you not use this size, which differs only a very little from what you have ordered?' The purchasing department says, 'Yes, but all the other parts are already in the machine shop and partially machined, and we are sorry, but we must have these special screws even at the high price you are obliged to ask for them.'

"So the special parts are ordered and incorporated and the worst of it is that the next time a new model is designed it may be desired to incorporate this axle or parts of it to save tools and fixtures; so again the special parts are ordered and it may be several years before the extra expense of obtaining special parts is gotten rid of. All this arose not from necessity but from the unguided idea of a draftsman.

"To guide the ideas of such draftsman is one of the principle functions of the Society of Automobile Engineers. The aim will be to put into the hands of every designing draftsman an Engineer's Pocketbook or a series of sheets which shall show him what is available in the way of screws, tubing, lock washers, rod ends, grease cups and the many fittings, that are standard.

"This system already exists in bridge building and other constructions and has been brought about by the large companies who furnish such materials. They publish hand books showing what the standard sections are for I-beams, angle irons and the like. The draftsman has formed a habit of going to such books to find out which size of I-beam he can obtain as a regular section. He manages to incorporate such a stock or standard I-beam in his design, with the result that no special rolls have to be turned up to produce it and no correspondence and communication as to special prices are necessary. This is the direction in which the Society of Automobile Engineers is working, and not with the idea of stifling original design.

"There will be no attempt to throttle original research as in changes in engines, changes in transmissions, or changes in any portion of an automobile. This does not alter the fact, however, that it is better to have a novel engine or a novel transmission made up of component parts which are standard and well tried

out, than one which is not only novel in design as a whole, but one in which every element is novel and untried.

"The S. A. E. stands ready to assist in manufacturing difficulties and necessities in any of the many component engineering fields of automobile production. As an example, the manufacturers of electric lighting systems for automobiles recently applied to the society to take up the matter of standardizing certain features of those systems, with particular reference to their attachment to automobiles. This matter was promptly referred to the miscellaneous division of the S. A. E. standards committee for action. As showing the breadth of the work of the society in standardization, it may be stated that the council of the society at a recent meeting passed a resolution that the size of its publications be made to accord with the practice of certain other engineering societies; that is, the sheet size to be 6x9 inches, or multiples or submultiples thereof."

In discussing the subject generally, Henry Souther, president of the Society of Automobile Engineers, supplements Mr. Clarkson's views in this language:

"In taking up the work of the S. A. E. with those not closely associated with that body, it is soon discovered that many have a wrong idea of what form the standardization will take and what it will accomplish. Many have an idea that the form, the design and the shape of large portions of the machine are to be made alike. Nothing could be farther from the truth. Such a procedure would throttle originality and hamper engineering work. There is not the slightest danger that this would ever be accomplished, even if it were attempted.

"What is aimed at is standardization of detail; such as screws, lock washers, spring parts, bearing parts, water connections and many other small pieces too numerous to mention. It has been found that the numbers of these parts continue to multiply because each draftsman exercises his ingenuity and his fancy, getting something out peculiar to his own notion. There can be no possible gain in originality in such details as these, and it is this useless multiplicity of parts that must be minimized.

"It will not be long before the beginning of the engineer's handbook will be placed in the hands of the members, and this handbook will contain information which will be useful in every drafting room. It will quicken the work of the draftsman by cutting out so much thought on useless details. There is nothing to give a draftsman now that is of much service. This handbook ought to be put into the hands of the members during the summer meeting; that is the plan."

In the mind of Howard E. Coffin, former president of the S. A. E. and the moving spirit in the Hudson Motor Car Co., there is no doubt of the benefits of standardization. He says:

"Any standardization at the present time should not be an attempt to standardize the practice of the engineers or the exercise of engineering ability, but should be an effort to standardize the practice of the \$15 a week draftsman, and the way to do that is to place upon the walls of the draftsman's room such reference tables as will guide him in working out the various problems that confront him. One cannot take the average draftsman, whether he be college graduate or not, and expect to supervise every movement of his pencil and dictate every dimension to be placed upon a drawing. It seems to me that the things to be standardized are the things which might just as well be standard as any other way. Those are the things which are giving our purchasing departments trouble at the present time. Those are the things which cost us money; those are the things we could just as well have correct when they leave our drafting room as to have those of you who are building component parts come and tell our purchasing department, 'If you had only made that a little different I could quote you a price of half what I have quoted you, because you insist on specifications which are not standard.' I think those are the things which we should certainly attack. All the rest of it will come in due time and come rapidly.

"A great many are unquestionably entering the commercial car field as a first effort at building motor cars. Others have gradu-

ated from or are still interested in the pleasure car end, and I think it is very easy to foresee that as the number of commercial cars increases, and as the number of makes of commercial cars increases—and we all know that they will increase until they probably outnumber the pleasure cars—it is very easy to foresee that the complications under which the commercial car builder is going to labor will be even far greater than those under which the pleasure car makers are laboring at the present time. Every engineering department probably will be specifying a different gauge of metal for every particular part of its wagon, and not because there is any engineering reason why it should be so, but because the draftsman employed, and who has been given no guiding data tables or book, will use his own good judgment. The checker will pass it over because the dimensions will check, and it will go to the purchasing department. The purchasing department will go to the steel maker to purchase it. The steel maker will say, "Why, that is a gauge that I do not regularly carry in stock," or "That is a size tubing that you will have to wait six weeks for." "That is a broach for a square hole that we do not carry in stock. It is two-thousandths different from anything we have. Therefore it will be necessary to wait for it six weeks, and pay a special price, while they roll it or draw it or manufacture it."

"Now is it not just as easy for us to cut down the number of gauges that are in the market, the number of sizes of tubing and the number of dimensions that are called for in broaches by getting these data together now and embodying them in engineering tables of reference which can be used just as are the rolling mill tables on steel sections, for instance, at the present time? Every one who builds trucks and employs a rolled section will get out one of the steel makers' little leather bound handbooks and look at the properties of the channel before he thinks of laying it out on the drafting board. Why should not this be done on the thousand and one other things that are absolutely within the draftsman's jurisdiction or within his ability to make either one way or the other? In other words, let us get the little things out of the inexperienced men's hands, and let us make it a matter of engineering practice, in the different types of design, etc., rather than deliberately place it in the hands of the inexperienced man to get us all into the same trouble later that we are in now on the pleasure car line. The National Lock Washer Co., for instance, is supplying between the sizes of 3-16 diameter bolts in 1/2 inch diameter bolts for pleasure cars 600 different sizes of lock washers, most of them made to order. Three years ago we found 1,600 different sizes of steel tubing specified by motor car makers and being rolled by steel mills. At least one builder was specifying 80 different sizes of tubing. The statement was made recently that within a year the S. A. E. would have the number of steel tubing necessary for motor car construction probably at 50 sizes, and certainly not above 75. The difference between 75 and 1,600, it seems to me, is worth playing for all along the line. It means quality, quantity output and economic output. It means the cutting out of delay in every phase of our business."

C. G. V. IMPORTERS FORCED TO THE WALL.

Following the filing of a petition in bankruptcy, Jesse Watson was appointed receiver for the C. G. V. Import Co., doing business at 49 West Sixty-fourth street, New York, where it handled the French C. G. V. car. The petitioning creditors were John C. Carley, \$15,255 on assigned claims for money lent to the company and its predecessor by Emile Voigt and others. The business was started in 1904, was carried on by a New Jersey corporation of the same name until November 9, 1907, when the New York corporation was formed, with capital stock \$120,000. Emile Voigt was president and treasurer.

VELIE TAKES TRUCK MANUFACTURE.

Commercial vehicles have been added to the productions of the Velie Motor Vehicle Co., of Moline, Ill. The first of them, a ton and a half and a three-ton truck, made their appearance in March.

TWIN TIRES.

M. Andre Michelin, addressing a scientific body on the subject of rubber tires, said some interesting things from the point of view of the expert tire maker. We quote a few of the remarks:

Two, sometimes three, Michelin pneumatic tires placed side by side on the same wheel constitute the Michelin twin tire. Taking 10 cwt. as the greatest weight which can be reasonably imposed on each tire of an ordinary wheel, a twin tire working under normal conditions can support 20 or 24 cwt. with ease. That is to say that with twin tires 40 to 50 cwt. would be a normal axle weight. The great increase in the durability of tires running as twins is easily understood in view of what we have called the Law of Weight, which is that: A tire wears out in nearly exact ratio to the cube of the load.

From this formula it is evident that, by fitting two tires together where formerly there was only one, we reduce the wear in a proportion which ought to be about one to eight. While this law is not absolutely mathematically exact in practice, it is sufficiently correct to account for much of the great economy of twin tire effects.

You will readily understand that the twin tire is more resistive; that it suffers less from contact with the brake—that terrible cause of the rapid wear of tires—inasmuch as it has four walls—whereas a single tire has but two—with which to stand the strain.

Inflation, again, plays its part in furthering the cause of economy. To support a weight of 12 or 13 cwt., a single 120 mm. tire must be inflated to a pressure of over 80 lb. to the square inch. Under the same weight a pressure of 40 lb. suffices for each twin tire; and not only is this low pressure—which would speedily result in serious damage to the single tire—perfectly satisfactory in the twins, but it increases their power of absorbing obstacles. Hence the two great reasons for the economy effected by the use of twin tires are: less strain under normal working conditions, and less risk of damage from sharp obstacles on the road.

When twin tires are used, the risk of being stopped en route by puncture is considerably lessened, for under ordinarily favorable circumstances a short distance can be covered on the single undamaged tire.

THE FRONT HINGED DOOR.

The hinging of the side doors of motor carriages on the front pillar instead of the rear one, has much to recommend it, in addition to the advantage of additional convenience to the passengers; but like many other things, unless the whole of the necessary fittings and mechanism is carried out properly, there is a great risk attending on its use. It is frequently asserted that if the door should be left open or insufficiently secured that the motion of the car forward will be sufficient of itself to close the door and to keep it closed, even if it did not slam it with sufficient force to slip the lock-bolt. This belief may easily be founded on insufficient evidence, for, unless the door swings freely on its hinges, it will not be closed by the passage of the car through the air, and if it should meet some obstacle such as a passing vehicle or a post, damage, more or less serious, would certainly ensue. The door will swing freely and close easily if it is set true upon its hinges, and, when this is the case, there need be little fear of its not closing sufficiently to clear passing traffic or ordinary obstructions met with on the road.

VEERAC FINISHES TRUCK AT ANOKA.

The Veerac Motor Co., which was organized in Minneapolis last year, has completed a factory at Anoka, Minn., and begun active operations. The purchasing and sales departments, however, will be maintained in Minneapolis at 422 Fourth street, South. Trucks will constitute the concern's output.

SUGGESTIONS FOR COMMERCIAL CAR BODIES.

Now that the wagon builder is getting busy making bodies to fit any make of chassis, it becomes interesting to note what foreign styles of wagon body building have to offer in the way of novelty. These we show on this page are from the best English authority, Cooper's Vehicle Journal, so are probably the best expression.

There is nothing of real novelty so far as we can observe; neither is there anything new in this country, although the conditions should create new thought—good or bad.

"AS ITERS SEE US."

A Britisher has just returned to London from the Canadian Northwest where he saw strange sights. He writes to Commercial Motor in this fashion for a page or two:

American motor machines have been described disparagingly as "cast-iron boxes of tricks," but they do their work, and do it satisfactorily, too. That is all the farmer cares about. The engines are of the very simplest description possible; permanency of location is unknown in the west, any class of laborer may be called upon to take the wheel—a first class mechanic to-day, and a clod-hopper to-morrow. It means that the machine has got to tolerate a large amount of hard usage. The more complicated its mechanism, the more likely the liability of breakdown. Some of the American engines have only three moving parts, acting on the two-cycle principle. These are excellent machines, and the amount of hard wear and tear they will withstand is astonishing, while they appear to be remarkably free from derangement. The breakdown of an engine in the middle of work while at high pressure is the one thing that the farmer fears with this type of vehicle.

COMMERCIAL TRUCK TESTS.

The use of the motor truck to expedite the transfer of army supplies has been carefully worked out by army officials, and with a large measure of success. An instance of this is the motor truck service operated by our army in manoeuvres.

By way of further demonstration of the adaptability of the motor truck for hauls that have to be quickly made, and over long distances, the manufacturers of the Saurer motor trucks have undertaken a unique test.

What they have been pleased to call the pioneer trip for a motor truck from Denver to San Francisco was started March 4. The truck is a five-ton piece, and carries a load of three to four tons. The return trip will be made to New York and then back to Chicago.

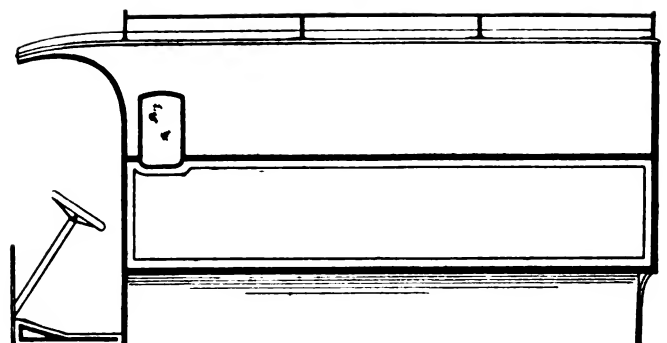
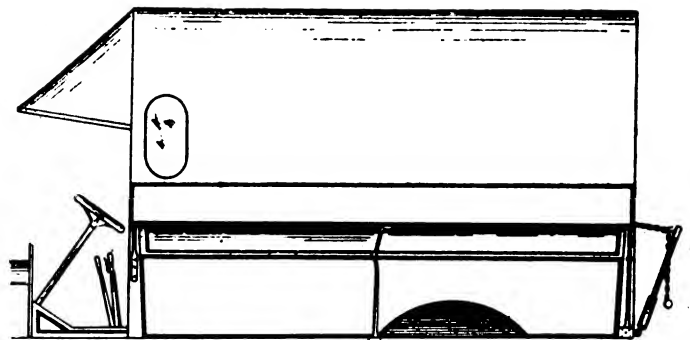
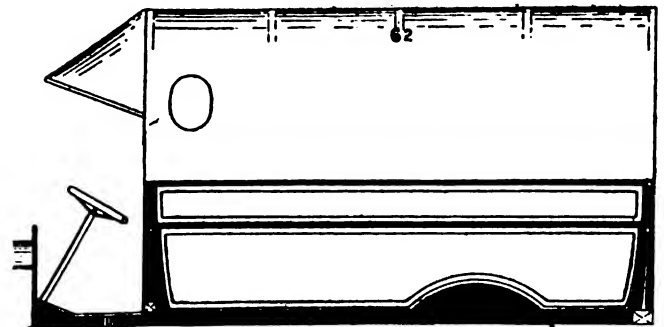
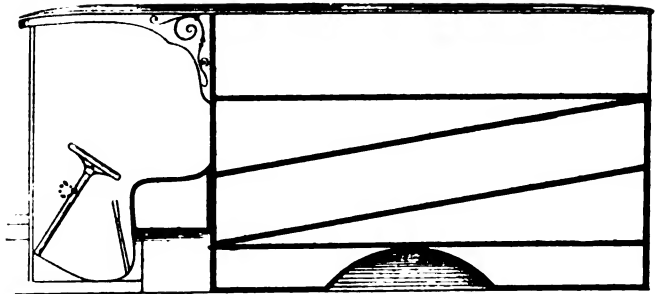
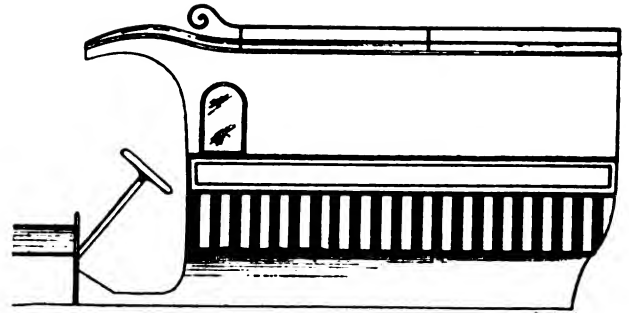
The truck is equipped with Goodrich wireless tires, single on the front wheels and twin on the rear.

ADMISSION OF TOURING AUTOMOBILES IN CANADA.

According to a memorandum of the department of customs, dated February 28, 1911, the regulations concerning the temporary admission of automobiles for touring purposes in Canada under bond or upon cash deposit (reproduced in Daily Consular and Trade Reports of November 2, 1910, and Foreign Tariff Notes. No. 1, pp. 21-21) are amended so as to extend the period during which such automobiles may remain in Canada from three to six months.

WELCH CARS NOT DISCONTINUED.

According to advices from General Motors' sources, the manufacture of the Welch car has not been wholly discontinued, as was announced. It is only the Welch-Pontiac that has been dropped; the Welch-Detroit will be continued.



A MOTOR TRIP ALONG THE MEDITERRANEAN.

John C. Wetmore.

I am writing this in the American consulate, whose location at Port Marchand, overlooking the beautiful harbor of Toulon, is ideal. Consul Mansfield's little DeDion landed him and me here after a ride of 143 kilometers from Cannes.

At La Napoule, almost on the outskirts of Cannes, we struck the famous Corniche d'or road. It is well named—"corniche" meaning a cornice and "or" referring to the golden sunshine of the Mediterranean coast.

It has an interesting history, having been built at the instigation of the Touring Club of France, which contributed 200,000 francs toward its construction. The balance was paid by the Paris-Lyons-Marseilles railroad and the local department. The road extends from La Napoule to San Raphael for forty kilometers through the Esterel mountain district, skirting the shore and following its constant indentations all the way, being actually carved from the rock for most of the distance. Imagine mountains skirting the north shore of Long Island to the water's edge and multiply its number of bays and tiny harbors by ten and you have the Corniche road. "Hairpin turns" abound in great numbers and of a variety that would make a Vanderbilt course "hairpin" seem as easy as the curves of Brighton Beach by contrast. It requires a good and cautious driver to negotiate it. As a fool-killer it would be without a rival; for a reckless pilot would be punished by being dashed over the cliff into the sea, several hundred feet below. No wonder they call it sensational.

It certainly is spectacular and ruggedly picturesque, as well with the cliffs rising abruptly to great heights on the one side and the bare expanse of the Mediterranean being in constant view on the other. It abounds in spots of historic interest, such as the island of Saint Marguerite, where the man with the Iron Mask was confined.

All along the road were the warning signs of the Touring Club of France, which, by the way, go further than merely pointing out the danger spots and give the motorist information as to interesting historic spots and how to reach them. The club even goes so far as to provide benches where there are particularly fine views. Along the roadside the auto advertising signs interested me not a little. Continental and Michelin tires were frequently exploited, but their signs did not compare in prominence or size with those of Goodrich, setting forth the location of its nearby agencies. Incidentally, Mr. Mansfield stirred my patriotic pride by pointing out on his DeDion a Goodrich tire that had outlasted two other sets of tires of foreign make.

We stopped for dejeuner at an old country inn at Frejus, where we put the car up in the cavernous stone stable adjoining without charge and without having any volunteer caretaker loafing around for a tip. We were now in the vineyard country of southern France, where the going was level most of the way, barring some eight miles across the mountains of the Maures. The latter are covered with cork forests, great quantities of the bark being shipped to the United States.

Most of the journey now was past vineyards, with the vines being but stalks a foot or so above the ground. They are all American roots, by the way, the native vines some forty years ago having been destroyed and the substitution of our roots having been the salvation of the grape growers. It may interest you to be told that this native wine sells at 3 cents a quart. Some fifteen miles from Toulon we passed through Hyeres, where the chief industry is supplying violets for Paris, London, St. Petersburg and other big capitals. It is also a popular resort for Englishmen, fully 2,000 of them spending their winters there. Bumping over Belgian blocks for several miles into Toulon, our journey ended at the garage, where our consul stores his runabout at a charge of \$2—think of it—\$2 per month.

Last evening we dined at one of the swell restaurants of the town, took our coffee on the sidewalk of a cafe partly sheltered by canvas awnings and "heated" by three large stoves. Then we

went to a vaudeville show where petits chevaux gambling furnishes the entre'acte attraction, and you get back your franc and crown besides, if you have placed it on the winning one of the nine toy horses that are sent whirling around a course in the center of the double ended layout. The policy of the government is to allow the officers of the ships and forts to lose their francs on petits chevaux, on the theory that it will keep them from staking larger sums at the clubs on other games.

THE INSIDE OF AN AUTOMOBILE PLANT.

The first stage of manufacture is the receiving room. The raw material, including the unfinished castings, made by specialists in that work, are received and sent to the department where the machine work is done. Here the rough castings are machined. Each machine has certain work outlined for it, and as the various parts are completed they are taken to the assembly rooms, where the small parts are put together, forming units, which, in turn, are added to other units. The connecting rods are fitted with studs and bearings, which bearings are then "scraped in" to fit the crank shafts. The crank cases are fitted with studs, bearings, cam shafts, cylinders, valves, push rods, magneto and pump. The lower half of the crank case is then bolted on and the motor is ready to be tested. In the same manner are the transmission and rear axles assembled.

After the motor has been run idle for hours, then put on the dynamometer under load and tested for power, and passed the inspectors, it is taken to the chassis assembly department. Here already its future resting place has been prepared in the frame, to which has been added the transmission gear system, dash, steering gear and other parts. The clutch is put in, a radiator is then connected up, test wheels put on, and the car is turned over to the testing department. It is assigned to a tester, who puts on a testing body, puts in grease and oil and then gives the car a try-out on the road. After inspections and adjustments it is passed on to the men who clean off the mud and dust with live steam, water and gasoline. The chassis is then taken up to the paint shop, the wheels are removed, and it is painted. Now it is ready for the body fenders and final assembly. In the meantime the body has been undergoing twenty-four operations in painting, the fenders, hood and wheels are painted. They all meet on the assembly floor, and, with the chassis, soon make a complete car.

THE "EFFICIENCY" ENGINEER.

Like all newly discovered industrial panaceas, many mistakes may be committed in its name. There are to-day scores upon scores of civil engineers out of a job, or shop foremen seeking other jobs, who are about to set themselves up as efficiency engineers, prepared to reduce costs and increase profits at a moment's notice. In that lies the danger of the new movement. The system itself as promulgated by F. W. Taylor, after thirty years of arduous, painstaking and costly experimentation, stands on its own bottom as a revolution in practical shop management. Mr. Taylor himself has no faith in the wholesale possibilities of the system and most earnestly condemns any effort made to achieve results with "short cuts." To him there is no royal road to success in the application of scientific management to any plant. What is required is hard work, unflinching patience and courage in the face of many obstacles. Practically four years were required to install the system in one Philadelphia plant, but those four years changed failure to success, and brought satisfactory dividends from a former condition of bankruptcy.

NEW DEPARTURE INCREASES TO \$5,000,000.

The New Departure Mfg. Co., of Bristol, Conn., maker of the New Departure bearings, among other things, has increased its capital to \$5,000,000. Previously it stood at \$1,500,000.

OBITUARY

ANTHONY G. BRUNSMAN.

The quite unanticipated demise of Mr. Brunzman, president of the Anchor Buggy Company, on March 16, at his home in Cincinnati will be a great shock to his hosts of friends. Literally hosts of friends, as there was no man in the vehicle building industry so widely popular.

Mr. Brunzman had been for some time a semi-invalid, but it was nothing that rest and abstinence from business could not mend, it was thought, and even very shortly before his demise he was up and about the house, acting more like one in a sanatorium than in the invalid state, hence, as said, the end came with the unexpectedness of a shock.

Mr. Brunzman was in his prime, being only forty-five. He had fought the business fight, won out handsomely and was prepar-



Anthony G. Brunzman.

ing to enjoy the fruits of victory. He had been a strenuous worker from the day he organized the Anchor Buggy Company in 1886.

His business career had all the monotony of success, it might be written, which is the best testimony to his ability. With it all he was public spirited and broadgauged to the highest limit. He loved his native city which had afforded him the stage for his life's action, and he was ever full of sympathy for every broad movement of his trade.

As president of the Carriage Builders' National Association, and as president of the local Carriage Makers' Club he was distinguished among his business associates. He was also prominent in social matters, being a member of the Business Men's, Queen City, Avondale and Hamilton County Golf Clubs, and was affiliated with the Elks.

Mr. Brunzman is survived by a widow, two brothers, W. J. Brunzman, and two sisters, Miss Genevieve Brunzman and Mrs. A. Schnitter.

William H. Jackson, carriage manufacturer, died at his home in Matteawan, N. Y., March 18. Mr. Jackson was born in Canada on April 6, 1837, and went to Matteawan when young. He began learning the wagon maker's trade at Fishkill. He returned to Matteawan in 1860 and began the manufacturing of carriages and

sleighs, adding harness making and other features. His son, Henry D., became associated with him 15 years ago, since which time the firm name has been W. H. Jackson & Son. Mr. Jackson is survived by two brothers and three sisters. His wife died in January, 1910.

Nicholas Langler, a manufacturer of supplies for iron workers and wagon makers, died in Brooklyn, N. Y. He was born in Germany seventy-six years ago.

E. K. Cutler, proprietor of the Pueblo (Col.) Carriage and Wagon works, died at the home of his daughter, Mrs. H. L. Titus in Sterling, Colo. For twenty-four years Mr. Cutler was a resident of Pueblo. He moved there in 1887 and a year later established the business. He was well known to all old residents of Pueblo and his death comes as a sudden shock. Mr. Cutler was 62 years old and is survived by two daughters.

John J. Malone, a well known wagon manufacturer, died at his home in Brooklyn, N. Y., of pneumonia. Mr. Malone was in his forty-third year.

Martin Leonard, one of the best known residents of Almond, N. Y., dropped dead at his home March 27. He was 75 years of age and had been engaged in the wagon making business for many years. He leaves three children.

William Smith, veteran carriage manufacturer and long-time resident of Burlington, Vt., passed away at his home of apoplexy on March 22. He was in his 80th year. Mr. Smith was born in Granby, Mass. Fifty-one years ago he went to Burlington from Montague, a town near Greenfield, Mass. He was widely known as a manufacturer of high grade carriages, among them being the famous Glens Falls buckboard and the Concord side-spring carriage. Mr. Smith is survived by Mrs. Smith and one daughter. There are three half brothers.

William H. Smith, 78, died after an illness of 12 days at his home in Springfield, Mass. He was the son of David Smith, who in 1826 established a carriage business at the corner of Main and Park streets. The son later entered into partnership with his father. He entered the employ of his father in 1849 and was admitted to partnership in 1856. David Smith retired in 1872 and his son carried on the business under his own name until 1903, when he took into partnership George H. Hubbell, as Smith & Hubbell. Mr. Smith was married in 1858 and had one child.

John F. Updegraff, for many years the New York and Pennsylvania representative of the Parry Manufacturing Co., died suddenly at Port Ewen, N. Y., on the morning of January 16. He is survived by a widow, three sons and a daughter.

John Dippel, aged 49, formerly a wagon manufacturer of New York City, died April 2 at his residence, 1495 Bushwick avenue, Brooklyn. He had been ill for five years. He was born in New York City 49 years ago and leaves his widow, Annie Tallowitz.

COMPANIES ARE CONSOLIDATED.

The American Motor Truck Co., of Lockport, N. Y., has been merged with the Findlay Motor Co., of which L. E. Ewing is president, and the Lockport plant is being dismantled and the machinery removed to the Ohio city. The Findlay company manufactured light delivery wagons and the American company made trucks of the larger sizes, the production of both of which will be continued on a more extensive scale, plans for the enlargement of the Findlay factory already being in hand.

TRUCKS FROM MICHIGAN.

D. F. Poyer, of Menominee, Mich., who has been engaged in the automobile business for a long term of years, has formed a partnership with W. S. Carpenter, president of the Lumberman's National Bank, under the firm name of D. F. Poyer & Co., and will begin the manufacture of light delivery wagons in Menominee.

Trade News From Near and Far

BUSINESS CHANGES.

Scioto Buggy Co., Columbus, Ind., reduced capital from \$50,000 to \$5,000.

P. F. Tully has sold out his stock of vehicles, etc., in Fullerton, Neb., to Q. H. Scott.

W. J. Towner has disposed of his stock of vehicles, etc., in Osage, Ia., to J. Casey.

A. M. Tate has purchased the stock of vehicles, etc., of Gardner Bros., in Osceola, Ia.

M. L. Parish, of Fairfax, S. D., has sold out his stock of vehicles, etc., to N. D. Hansen.

Burns Bros., Havre de Grace, Md., will open a branch repository at Elkton, same state.

Meyer & Parke Carriage Co., has moved from Ft. Wayne, Ind., to Richmond, same state.

J. E. Elson has disposed of his stock of vehicles, etc., in Williamsburg, Ia., to Penley Bros.

David Cook has purchased the stock of vehicles, etc., in Blue Springs, Neb., of A. H. Krauss.

H. P. Jensen, vehicles and implements, has sold out to Salisbury & Jobin at Mankato, Minn.

Chas. A. Myers has succeeded to the stock of vehicles, etc., of Bray & Baker, in Sumner, Wash.

G. F. Pike & Co., formerly of Amesbury, Mass., is moving into new quarters at Los Angeles, Cal.

Aaron Nehfing has succeeded to the vehicle business of Nehring & Krueger, in Paynesville, Minn.

Deibert Bros. have disposed of their stock of vehicles, etc., in Sylvan Grove, Kas., to L. A. Criegee.

H. N. Tucker has disposed of his stock of vehicles, etc., in Courtenay, N. D., to A. B. Cox & Son.

Schreiber Bros. have disposed of their stock of vehicles, etc., in Omlitz, Kas., to Milberger & Stensel.

N. N. Rockwood has purchased the vehicle and implement business of George Tine, in Alburnette, Ia.

Charles Plegeman has sold his stock of vehicles and implements in Stanton, Neb., to Wagner & Son.

Automobile Maintenance & Mfg. Co., at Chicago, Ill., has changed its name to the Walker Vehicle Co.

J. F. Thomanson & Co. have purchased the stock of vehicles, etc., of McKee & Edmundson, in Altoona, Ia.

Koranda Bros. have disposed of their implement and vehicle business in Kimball, S. D., to Shifer & Glynn.

The Phipps-Grinnell Auto Co. has succeeded to the business of the Phipps Electric Auto Co. in Detroit, Mich.

The Stebbins-Gaffield Co. has succeeded to the stock of vehicles, etc., of John W. S. Pierson & Co. in Stanton, Mich.

The Hailey carriage factory at Tecumseh, Mich., which was conducted for years by John R. Hailey, will be reopened by his son, Frank J. Hailey, who was formerly general manager of the factory.

The partnership existing between Arthur Christie and D. S. Sanderson, as the Truro (N. S.) Carriage Company, was dissolved by mutual consent February 4, the business being carried on by Mr. Christie.

It is reported that the A. T. Demarest Company, formerly one of the oldest carriage building factories in New Haven, Conn., which recently removed the last part of its plant to New York, contemplates moving part of its business back to New Haven.

With the exception of the plant, buildings and manufactured stock on hand, the entire holdings of the Hickman-Ebbert Company, which were purchased by J. W. McCulloch some months

ago, have passed into the hands of the Owensboro Wagon Company, of Owensboro, Ky.

A deal was consummated whereby local stockholders of the Duplex Motor Car Co., at Charlotte, Mich., sold their holdings to Chicago parties. The Duplex company is a manufacturer of heavy auto trucks. This means that within a short time the company will remove to Muskegon.

A reorganization of the Buck Auto, Carriage and Implement Company, Davenport, Ia., was effected at a meeting of the directors when John W. Buck, president, and Emil J. Buck, vice-president, withdrew from the corporation. C. F. Buhmann was elected to succeed Mr. Buck. He will also retain offices of secretary and treasurer. P. R. Albrecht was chosen vice-president. The members of the board of directors, including the officers are: Otto Witt, Stuart Towle and Henry W. Arp. John W. Buck said that with his son, Emil Buck, he would probably start a new automobile business in Davenport.

NEW FIRMS AND INCORPORATIONS.

M. F. Kistler, Neffs, Pa., has opened a vehicle repository.

M. S. Merkel, Fleetwood, Pa., has opened a wheelwright shop.

W. R. Holland has opened a new stock of vehicles, etc., in Wilson, Neb.

The Williams Wagon Works has been established in Milledgeville, Ga.

The Bamman Buggy & Wagon Works will build a factory in Macon, Mo.

Clark & Gage are about to open a new stock of vehicles in Colton, S. D.

John A. Applewhite has opened a new stock of vehicles, etc., in Laredo, Tex.

Fred Rhode, of Craig, will soon engage in the vehicle business in Bertha, Neb.

J. C. Walsh & Son have engaged in the vehicle business in Grand Lodge, Mich.

Jestrab Bros. have engaged in the vehicle and implement business in Havre, Mont.

Gale Wilson is about to engage in the vehicle and implement business in Salina, Kas.

Charles Davis is about to engage in the vehicle and implement business in Waukon, Ia.

Christopher Auber, Jersey City, N. J., will open a wheelwright shop at 816 Jersey avenue.

Bert & Ed Armstrong are opening a new stock of vehicles and implements in Reinbeck, Ia.

Goodner & Crum, of Weatherford, Okla., will open a stock of vehicles, etc., in Hydro, Okla.

Guy Ocheltree is erecting a building in Betts, S. D., and will install a stock of implements.

Oscar & Alfred Westrum are engaging in the vehicle and implement business in Freda, N. D.

The Hines Buggy Co. has been incorporated in Boykins, Va., with W. W. White as president.

The Shores Motor Co. has been incorporated in Wytheville, Va., with a capital stock of \$10,000.

Wm. Dunn and F. M. Roberts have engaged in the implement and vehicle business at Rose Hill, Ia.

The Muskogee Harness & Buggy Co. has been incorporated in Muskogee, Okla., with a capital of \$10,000.

The Lanphere Carriage & Auto Co. has been incorporated in Carthage, Mo., with a capital stock of \$15,000.

Service Motor Car Company, Wabash, Ind., manufacturers, in-

corporated with a capital stock of \$500,000; directors C. S. Rieman, B. F. Rieman, Ford Rieman, E. A. Bullock, C. E. Cowgill, The Blaney Hub and Buggy Company, of Blaney, S. C., has been commissioned with a capital stock of \$6,000.

The Worth Electric Vehicle Co. has been incorporated in Richmond, Va., with a capital stock of \$25,000.

The Bowling Green Motor Car Co. has been incorporated in Bowling Green, O., with a capital stock of \$100,000.

The Henderson Buggy & Implement Co. has been incorporated in San Angelo, Texas, with a capital stock of \$25,000.

Wayne Motor Co., Detroit, Mich., incorporated, capital \$30,000. Incorporators, G. H. Woods, W. H. Woods, Andrew Hunter.

Michigan Steering Wheel Co., Detroit, Mich., capital \$7,000. Incorporators, T. L. Denk, E. A. Bresler, W. B. Arbury, H. J. Denk.

The Iowa Manufacturing Co. has been incorporated in Grinnell, Ia., to manufacture buggies, farm wagons and commercial vehicles.

City Carriage Works, Ft. Wayne, Ind., capital \$20,000, to manufacture and sell vehicles, has been incorporated by John B. Ropape and C. J. Romary.

The Automobile Company, of Columbus, Ohio, automobile makers; capital, \$30,000. A. F. Duckinson, Wm. F. O'Hara, H. S. Bobo and Frank Loveman, incorporators.

The American Implement Co., Chicago, implements, vehicles, etc., has been incorporated, capital \$19,000. Incorporators Paul A. Neuffer, Charles J. Horn, Chas. W. Hembling.

J. M. Harter and Nelson G. Hunter

The Henderson Wagon Works Company was organized at Henderson, Ky., March 24, with a capital of \$300,000. The incorporators are Paul J. Marrs, M. V. Denton, C. P. Schlamp, James E. Rankin and J. R. Barret. It is the intention of the company to take over the Coquillard Wagon Works plant.

East Side Carriage Co., has been incorporated at Indianapolis, Ind.; incorporators C. A. Johnson, Marion O'Hara, J. W. Potter.

At Cincinnati—The Charles Bernhardt Co., vehicles, has been incorporated; capital \$25,000. Incorporators, Chas. Bernhardt, J. A. Bernhardt, Chas. J. Bernhardt, Mary Bernhardt.

IMPROVEMENTS—EXTENSIONS.

Haynes Automobile Co., Kokomo, Ind., has issued \$200,000 preferred stock.

Capital Carriage Co., of Fresno, Cal., will open a branch at Boise City, Idaho.

Louis Stephen, an implement dealer of Waco, Neb., is adding a line of automobiles.

The Decatur (Ind.) Motor Car Co. increased its capital from \$150,000 to \$200,000.

The Racine (Wis.) Mfg. Co., has increased its capital from \$600,000 to \$800,000.

Enterprise Carriage Works, Pensacola, Fla., will remove into new and larger building.

The King Leather Tire Co., Milwaukee, Wis., increased its capital from \$40,000 to \$60,000.

Schurmeier Wagon Co., St. Paul, Minn., has increased its capital stock from \$75,000 to \$100,000.

The capital stock of the Clarke-Carter Automobile Co., in Jackson, Mich., has been increased from \$100,000 to \$250,000.

The George W. Davis Carriage Company, of Richmond, Ind., has filed notice of increase of capital from \$30,000 to \$60,000.

The Parry Manufacturing Company, of Indianapolis, Ind., is to open a distributing depot in Sioux Falls, for its customers in that section.

Alden Sampson Manufacturing Co., one of the United States Motor's constituent companies, which removed to Detroit from Pittsfield, Mass., is now working a night force. Capitalization of the company has been increased from \$500,000 to \$2,500,000.

J. P. Saddler, a former buggy manufacturer of Owensboro, Ky., has closed a trade in Bowling Green, Ky., for the erection of a suitable building for a similar establishment of buggies as soon

as the building is complete and necessary machinery is installed.

The Booth Demountable Rim Co., of Cleveland, O., has increased its capital stock from \$100,000 to \$200,000, and will immediately enlarge its facilities to permit of an output of 100 sets of rims per day. The new shares were subscribed for within one hour after their issuance was decided on.

PROSPECTS.

G. G. Shaw, a representative of an Indianapolis company preparing to manufacture the Star automobile, has been in Logansport, Ind., conferring with local men relative to the establishment of the factory there. It is proposed to place \$75,000 worth of stock.

Menominee, Mich., is to have an automobile factory which will be in operation soon. D. F. Poyer & Company have decided to go into the manufacturing business and their line will be automobile trucks.

A new industry will soon be started by the Mifflinburg (Pa.) Body and Gear Company. This company is incorporated for \$30,000. The stockholders are Horace W. Orwig, David F. Gutelius, W. F. Brown, Robert Gutelius, A. C. Ehrhart, H. F. Blair, J. W. Gutelius, J. K. Reish, H. A. Gast and W. F. Sterling, of Mifflinburg, and O. S. Bucke, of York. A plot of ground containing about three acres has been purchased for a site. The location is on the Pennsylvania Railroad. By July the plant will be equipped and ready for operation.

The removal of the machinery of the plant of the Heaton Wagon factory from Neosho, Mo., to Fort Worth, Tex., is making rapid progress and the machinery is shipped to Fort Worth as fast as it can be prepared.

The Chamber of Commerce of Defiance, O., decided to assist the Defiance Carriage Company in securing a new location nearer the center of the city.

Bright prospects for the securing of another factory, the Layton steel wagon works, followed the meeting of the executive committee of the Board of Trade of Vincennes, Ind.

PERSONAL.

Col. J. E. Herschberger, of the Tiffin (Ohio) Wagon Works is recovering from typhoid.

George Schmidt, vehicle dealer of Palestine, Texas, is a candidate for mayor.

William Smith, the veteran carriage manufacturer of Burlington, Vt., is seriously ill at his home.

Harry Van Valkenburg, superintendent of the Pittsfield (Mass.) Carriage Manufacturing Company, was seriously injured by a fall.

The Henney Buggy Company band, Freeport, Ill., will be under the direction of Robert Gibler this season. The band is fixing up excellent club rooms.

J. W. Mack, of the firm of Mack Bros., auto truck manufacturers, New York and Allentown, Pa., is looking over sites for a plant the firm will establish on the Pacific Coast during the year.

Elden Leonard, who recently resigned as assistant manager of the Ford Wheel Works, at Troy, Ohio, did so to accept the agency for an automobile firm, and will soon open up a garage and general sales office at Tipp City.

B. S. Bridges, superintendent of the pole and shaft department of the Freeport (Ill.) Carriage factory, has resigned and will go to Chicago, where he has accepted a more lucrative position. Mr. Bridges has been connected with the Freeport carriage factory for the past six months, coming from Texas.

At the annual meeting of the Pekin Wagon Company, Pekin, Ill., reports submitted showed the company business to be in excellent condition. The business of 1910 more than doubled that of any other previous year. The following officers were elected: President, H. G. Herget; vice-presidents, W. A. Ebbert and Adam Saal; secretary, Henry Birkenbusch; treasurer, U. J. Albertson.

Mr C. C. Fisher, who formerly represented the Staver Carriage

Company in Southern Wisconsin, and Northern Illinois, has accepted the position of assistant sales manager of the Emerson Carriage Company of Rockford, Ill. The rapid growth of the latter concern has been remarkable and they are planning to greatly increase their volume of business. Mr. Fisher should be a very able assistant.

A. E. Lasnier, manager of the Hannibal (Mo.) Wagon Co., has sold his interest in the factory to a firm in Kankakee, Ill, and moved to Concordia, Kas. N. L. LaBlond will manage the factory for the new owners. Mr. Lasnier was the founder of the Hannibal Wagon Co., having been one of the organizers of the Anti-Friction Spiral Bearing Co., which he later gained control of and consolidated with the Beggs-Goodson Wagon Co., to form the Hannibal Wagon Co.

BUSINESS TROUBLES.

Wm. B. Clark, Buffalo, N. Y., has filed a bankruptcy petition. Debts, \$39,331.18; assets, \$2,602.

The Ovid Carriage Company, Owosso, Mich., stockholders and creditors held a meeting, as a result of which F. A. Marshall and J. H. Robson were chosen trustees. The trustees will run the plant until the present stock is consumed.

On the petition of a stockholder the Anderston Trust Co. has been appointed receiver for the American Steel Wheel Co., of Alexandria, Ind.

The D. M. Sechler Implement and Carriage Company has begun suit for an alleged debt of \$400 against Tollington & Donahue, in the circuit court at Joliet, Ill.

The Fish Bros. Mfg. Company, located at Clinton, Ill., has gone into the hands of a receiver. The gross assets are \$350,000, and the liabilities are \$250,000. There are approximately 200 creditors. It is announced the business will be reorganized and continued.

The Clinton (Iowa) Wagon Works, which suspended activities when the company directors made an assignment, resumed work with one-half its regular force. A reorganization will be effected soon. The assets are said to be \$100,000 in excess of the liabilities.

By order of court the plant of the American Steel Wheel Co., of Alexandria, Ind., was sold by the receiver, the Anderson Trust Company, to Joseph Ziegler, of Anderson. His bid was \$24,300. Mr. Ziegler was the plaintiff for the receivership about a month ago.

Superior Judge Austill, of Anderson, Ind., approved a contract between Henry Nyberg, of Chicago, and Receiver T. J. Delahunt, of the Rider-Lewis Motor Car Company, of Anderson, by which Nyberg agrees to buy the Rider-Lewis automobile factory for \$40,000.

FIRES.

Joseph Dombrowski, Racine, Wis., suffered slight loss from fire.

McLaughlin Carriage Co., Winnipeg, Man., loss \$50,000, fully covered.

Edgar E. Shannon, Oswego, N. Y., sustained \$2,000 damage by fire; half covered.

The stock of vehicles, etc., of J. S. Harris, in New Market, Ia., has been destroyed by fire.

E. B. Ferguson, Benton, Ky., vehicles and implements, damaged by fire. Loss \$8,000 to \$10,000.

Vaughn Mfg. Co., Jefferson, Wis., suffered a fire loss of \$40,000 in its wagon factory; partly covered.

The Eight Wheel Wagon factory, Hattiesburg, Tenn., was destroyed by fire. Loss complete and no insurance.

The plant of Wilmington Wheel Manufacturing Co., at Elsmere, Del., was damaged to the extent of \$3,000 on March 31.

Fire at Jefferson, Wis., destroyed the wagon works of the Vaughn Manufacturing Co., entailing a loss of \$40,000. The factory will be rebuilt.

Fire caused a loss of about \$20,000 on the stock and \$1500 on

the plant of the United States Carriage Company, Columbus, O., March 6. The fire started in the boiler room in the basement of the building. There was little loss by fire and almost all the loss was due to water, which drenched many valuable automobiles, hearses and other costly vehicles kept in the display room on the first floor. The only vehicles reached by the flames were several on the second floor, which were placed there for repairs.

WHAT ROGERS SAYS U. S. WILL DO.

Within a year or two the American automobile manufacturer is going to capture the foreign markets of the world," says G. Vernon Rogers. "America is the only country having a sufficiently large market to permit of manufacturing in quantities to bring the prices down to the lowest possible figures.

"An English automobile factory with a national reputation will make 300 cars a year; an American factory with a name of the same standard will make 10,000. There are a few French factories making 1,000 or 2,000 cars a year which gives them a much better opportunity to compete than the English, but they spoil their advantage by trying to turn out twenty or thirty different chassis, losing all the gain of quantity production. They do not seem to grasp the American manufacturer's idea of what manufacturing is, and are really makers rather than manufacturers who build one car at a time, and are always ready to make changes to suit their individual tastes. It is only a question of a short time before the American motor car manufacturer will control the world's market."

BACK TO START.

The Kentucky Manufacturing Company, (Louisville) which several months ago announced that it would sell direct from the factory, will go back to the old system of disposing of their supplies through the dealer. This announcement was made by W. C. Nones, president, in a letter to the trade, giving the reasons for the change. The company declares that its system recently has been conflicting.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word. Initials and figures count as words. Minimum price, 30 cents for each advertisement.

POSITION WANTED.

Wanted—Position as traveling salesman and work in office when not traveling, with a carriage wheel concern. Twenty years' experience. Can give best references. Address F. M. C., care The Hub, 24 Murray street, New York City.

Position Wanted—A thoroughly competent man with experience in designing, drafting and building of carriage and automobile bodies, desires position as draftsman or foreman of body department. Address W. K., 24, care The Hub, 24 Murray St., New York.

HELP WANTED.

Wanted—A young draughtsman competent to take charge of cost department. Give age, experience and salary expected. Henney Buggy Co., Freeport, Ill.

Wanted—Immediately, carriage body builder and wood worker who understands drafting and working from blue prints, and can make up sample carriage, cutter and automobile bodies. Married man preferred. State wages required. Steady job to right party. Apply Box 95, care The Hub, 24 Murray St., New York City.

Wanted—Painter for truck and bus work, must be good letterer and first class painter. Fifty cents an hour, steady work, no labor trouble. Address B. F., 96 care The Hub, 24 Murray street, New York City.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

The TIMKEN ROLLER BEARING CO.

MAKERS OF TIMKEN ROLLER BEARING AXLES
for **WAGONS and CARRIAGES**



Canton, Ohio

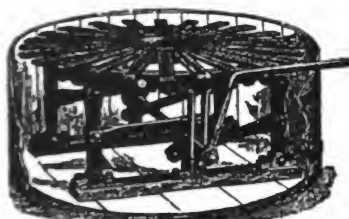
A Set of
TIMKEN AXLES
will save your
CUSTOMERS
these two horses

This statement is based on the experience of
thousands of users.

New Catalog and Price List upon application.

THE TIMKEN ROLLER BEARING CO.,
CANTON, OHIO,

BRANCHES- 10 E. 31 st Street, New York.
429 Wabash Avenue, Chicago.



The Bokop Tire Setter and Cooler
Is the Best and Only Machine
that has stood the test during
the last 12 years on all classes of
work, and is the Only Machine
built with the Indestructible
Wrought Iron Face Plate.
Over 1,000 are in successful op-
eration, repairs on which have
not exceeded \$8.00 in the last 12
years. For prices, references and
descriptive circulars, address
BOKOP, WEBB & PALM,
Defiance, Ohio

E. SCOTT PAYNE CO.
OF BALTIMORE CITY
CARRIAGE AND AUTOMOBILE
HARDWARE

362 and 364 North Gay Street,
BALTIMORE, MD.

CARRIAGE SPRINGS

OF EVERY STYLE AND PAT-
TERN TO ORDER

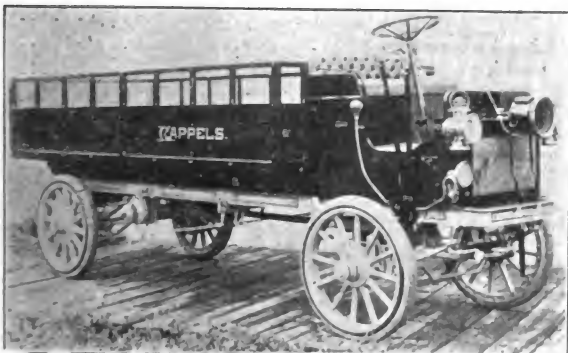
Also Curtain Rollers and Concealed Hinges

EXCLUSIVELY FIRST-CLASS WORK

THE BEST THAT CAN BE MADE

SPRING PERCH CO.

BRIDGEPORT, CONN.



The Grammm is made in 1-ton, 2-ton, 3-ton and 5-ton models.

The GRAMM Was a Success Before Other Commercial Cars Came Into Existence

Ask any well posted man to tell you
what commercial cars were promi-
nent when the really great American
pleasure cars were first making his-
tory.

"Well," he will say, "there was the
Grammm —"

And there he will stop. He knows the
Grammm because a decade ago B. A.
Grammm had marked out the way
for other successful trucks to follow.
The Grammm was a notable, practical
achievement long before competing
commercial cars came into being.

Those years of extraordinary experi-
ence are the Grammm's greatest as-
set; no truck buyer can close his

eyes to the fact that other trucks
must pass slowly through the same
trying period of development.

Wherever the Grammm has entered into
a contest with other trucks, the value
of that long experience in truck
building was made clear.

The Grammm has not only made re-
peated perfect road and technical
scores when handicapped with over-
loads, but IT WAS ALWAYS
READY TO REPEAT ITS SUPERB
PERFORMANCE.

In addition to the Grammm's efficiency,
its marvelous records in economy
tests offer the most powerful appeal
possible to the shrewd truck buyer.

You must inevitably judge all other motor trucks by the Grammm.

107 South Lima Street, Lima, Ohio, U. S. A.


THE GRAMMM MOTOR CAR CO.,

New York Headquarters: CROSS-MAGILL MOTOR TRUCK CO., 30 Church St., New York City.


Let us send you our monthly "Grammm."

The Higgin
LINE OF CARRIAGE TRIMMINGS


KNOBS



No. 70.




No. 133




Closed.
The Higgin Quick Shifter.




KNOBS



No. 72.



No. 130.

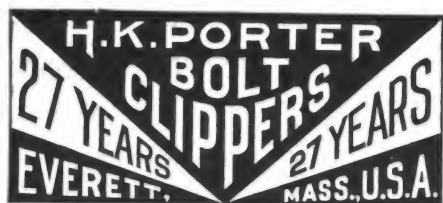
Full Leather No. 74. No. 13—Black Japan Nut

QUALITY UNSURPASSED.


Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co. Newport, Ky.

Richard Eccles Co., Auburn N. Y.
Manufacturers of
Forgings: Carriage, Wagon, Automobile, Special
Send for Catalogue.



VEHICLES AND GEARS IN THE WHITE



**PREMIER
SIDE SPRING GEAR**

We manufacture a full line of Carriage and Wagon bodies in the white; also Limousine, Taxicab, Touring Car and Roadster Bodies for automobiles in metal. Fifty styles of gears for Carriages and Wagons; also seats, trimmings and tops of all kinds.

Write to us for particulars.

Schubert Bros. Gear Company
ONEIDA, NEW YORK.

INDEX TO ADVERTISEMENTS.

American Ball Bearing Co., The	3
American Roller Bearing Fifth Wheel Co.	18
Ault & Wiborg Co., The	3
Bailey & Co., Inc., S. R.	18
Barbour Steel Tire Co.	4th cover
Bokop, Webb & Palm	11
Boub Wheel Co., H., The	18
Columbus Bolt Works	4th cover
Consolidated Rubber Tire Co.	2nd cover
Crane & MacMahon	2nd cover
Decker, J. C.	3rd cover
Devoe, F. W., & Reynolds Co., C. T.	3rd cover
Eberly & Orris Mfg. Co.	3rd cover
Eccles Co., Richard	12
Enterprise Foundry, The	13
Gerhab, Jacob	4
Gifford & Son, John A.	13
Goodrich Co., B. F., The	5
Goshen Eyelet Co.	14
Gramm Motor Car Co., The	11
Higgin Mfg. Co.	12
Hoopes Bro. & Darlington, Inc.	2nd cover
Jones & Co., Phineas	4-6
Keystone Paint & Filler Co.	4
Kilvington, S. W.	18
Koller Co., J. B.	3rd cover
Masury & Son, John W.	2
Mayo Radiator Co.	4
McKinnon Dash Co.	4th cover
Mercer, Geo. J.	18
Moller & Schuman Co.	6
Moore & Co., Benjamin	4
Nelson Co., A. T. A.	2
New Wapakoneta Wheel Co., The	13
Payne Co., E. Scott	11
Porter, H. K.	12
Reilly, John, Inc.	2
Russell, Burdsall & Ward Bolt and Nut Co.	3rd cover
Schubert Bros. Gear Co.	12
Spring Perch Co.	11
Standard Automatic Mfg. Co.	17
Standard Oil Cloth Co.	18
Standard Wheel Co.	1
Steel Socket Shaft End Co.	13
Timken Roller Bearing Co.	11
Uebelmesser Co., Charles R.	14
United Rim Co.	1
Valentine & Company	6
West Tire Setter Co.	6
Wiggers Furniture Co.	4th cover
Wilcox Mfg. Co., D.	15
Wiley Co., C. A.	4
Woodman, Joel H.	14

Please mention "The Hub" when you write.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Burlington Rubber Tire Machine

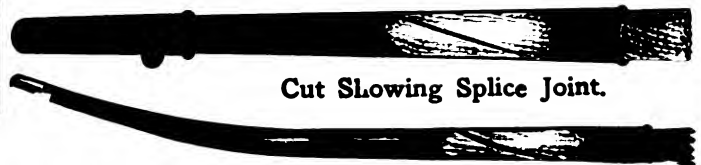


Our big No. 4 is the only machine made that will apply all kinds of solid and cushion rubber tires both internal and outside wires and close the joint on the same machine. One man can operate the machine easily without help. Put an end to your troubles in applying tires by investing in this machine. Write for descriptive circulars and price.

THE ENTERPRISE FOUNDRY
HARVEY, ILL., U. S. A.



Splice Joint Shaft and Pole Ends Give Perfect Satisfaction



Cut Showing Splice Joint.

THE SPLICE JOINT where the woods meet adds great strength, guarantees them against breaking where repaired, and prevents working loose and rattling. No shaft end without this construction can possibly give reliable service. No other shaft end than the Splice Joint can have these advantages, as we are the original manufacturers, and these features are fully covered by our patents. Insist on having the original Double Tube Splice Joint Steel Socket Shaft Ends and you get the best.

Handled by All Leading Jobbers.

STEEL SOCKET SHAFT END CO. CLEVELAND, O.

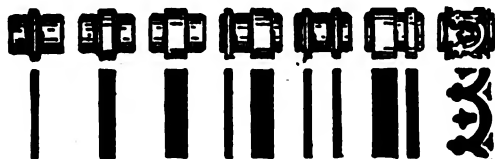
Please mention "The Hub" when you write.



Painters and
Decorators Save Time, Labor
and Money, using the

Uebelmesser Striping and Stencil Wheel

With this simple, clean and rapid-action tool the most ordinary decorator can do the finest striping and stencil work and produce a bigger day's work with less labor than by the old fashioned method. Complete directions are furnished with each tool. They are as simple as the tool itself.



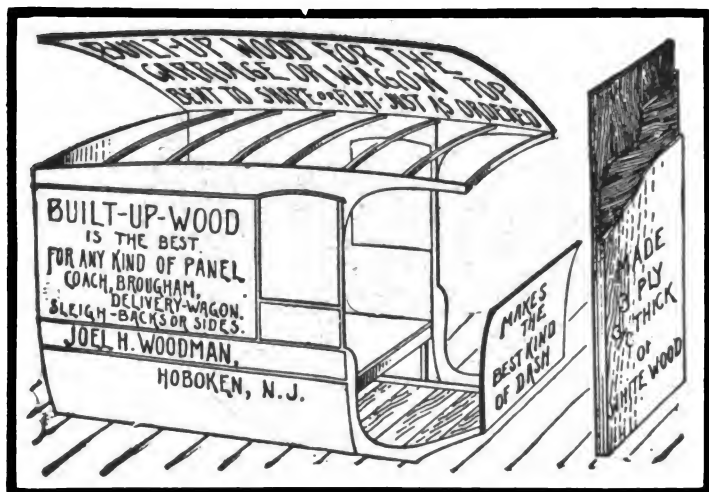
Just a few of the many designs that can be produced with the Uebelmesser Painters' and Decorators' Tool. (The designs shown above are reduced in size)

Complete Outfit consisting
of Machine, 10 Plain and 10
Ornamental Wheels, only... **\$5.50**

LIBERAL DISCOUNT TO THE TRADE

Manufactured by

Charles R. Uebelmesser Company
Bayside, New York, N. Y.





Goshen Eyelet Co.

Manufacturers of

**Carriage
Top
Trimmings**

GOSHEN, INDIANA

Advertisements Classified

The following list includes advertisers in THE HUB. Each advertiser is entitled to name under one heading only. An extra charge for name under more than one heading.

Axles

American Ball Bearing Co.,
Cleveland, Ohio.
Keagy & Lear Machine Co.,
Coshocton, Ohio.
Timken Roller Bearing Co.,
Canton, Ohio.

Automobile Radiators

Mayo Radiator Co., New Haven, Conn.

Bodies, Seats, Etc.

Kilvington, S. W., Wilmington, Del.
Wiggers Furniture Co., The, Cincinnati, Ohio.
Woodman, Joel H., Hoboken, New Jersey.

Bolts and Nuts

Columbus Bolt Works, Columbus, Ohio.
Russell, Burdall & Ward Bolt and Nut Co., Port Chester, N. Y.

Carriage Forgings.

Columbus Bolt Works, Columbus, Ohio.
Eccles Co., Richard, Auburn, N. Y.
Indiana Forging Co., Indianapolis, Ind.

Carriage Hardware.

Gifford & Son, John A., New York.
Ochsner & Sons Co., A., New Haven, Conn.
Payne Co., E. Scott, Baltimore, Md.

Carriage Goods

Gifford & Son, John A., New York.
Higgin Mfg. Co., Newport, Ky.

Dashes, Fenders, Rails, Etc.

Bennett Mfg. Co., Alden, N.Y.
McKinnon Dash Co., Buffalo, N. Y.

Fifth Wheels

American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.
Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Finished Vehicles

Balley & Co., Inc., S.R., Amesbury, Mass

Gear Irons

Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Gear Woods

Andrew Kimble, Zanesville, O.

Lamps

Gifford & Son, John A., New York.

Leather

Nelson, A. T. A., Co., Cincinnati, Ohio.
Reilly, John, Inc., Newark, N.J.

Lubricating Device

Aden Mfg. Co., Dansville, Va.

Motor Trucks

Gramm Motor Car Co., The Lima, Ohio.

Machinery and Tools

Bokop, Webb & Palm, Defiance, Ohio.

Enterprise Foundry, The, Harvey, Ill.

Porter, H. K., Everett, Mass.
Standard Automatic Mfg. Co., New York.

West Tire Setter Co., Rochester, N. Y.

Miscellaneous

Goshen Eyelet Co., Goshen, Ind.
Standard Oil Cloth Co., New York.

Uebelmesser Co., Charles R. Bayside, New York.

Rubber Tires

Consolidated Rubber Tire Co., New York City.

Goodrich Co., B. F., Akron, O.

Rims

United Rim Co., Akron, Ohio.

Shaft Couplings and Anti-Rattlers

Eccles Co., Richard, Auburn, N. Y.

Metal Stamping Co., New York City.

Steel Socket Shaft End Co., Cleveland, Ohio.

Spark Plugs

Ball Multi-Spark Plug Co., Minneapolis, Minn.

Springs and Gears.

Kevstone Spring Works, Inc., Philadelphia, Pa.

Spring Perch Co., Bridgeport, Conn.

Varnishes, Paints and Japans

The Ault & Wiborg Co., Cincinnati, Ohio.

Devos, F. W., and C. T. Raynolds Co., New York City.

Masury & Son, John W., New York and Chicago.

Moller & Schumann, Brooklyn, N. Y.

Murphy Varnish Co., Newark, N. J.

Valentine & Co., New York, Chicago, Boston, Paris.

Wiley Co., C. A., Hunter's Pt., New York City.

Wheels

Crane & MacMahon, New York
Gifford & Son, John A., New York.

Hoopes Bro. & Darlington, West Chester, Pa.

Jones & Co., Phineas, Newark, N. J.

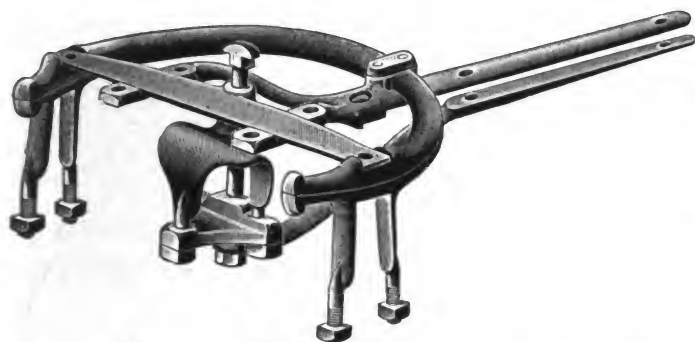
New Wapakoneta Wheel Co., Wapakoneta, Ohio.

Standard Wheel Co., Terre Haute, Ind.

Wheel Stock, Bent Wood, Etc.

Crane & MacMahon, New York

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



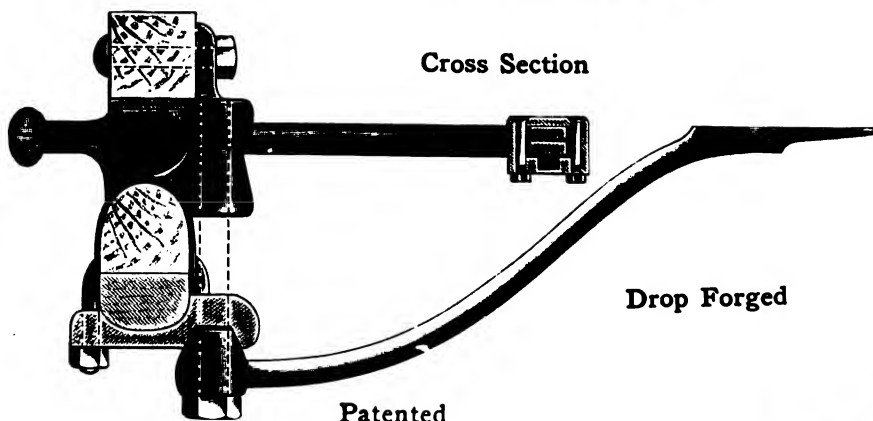
No. 1908—Gear Iron



No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.

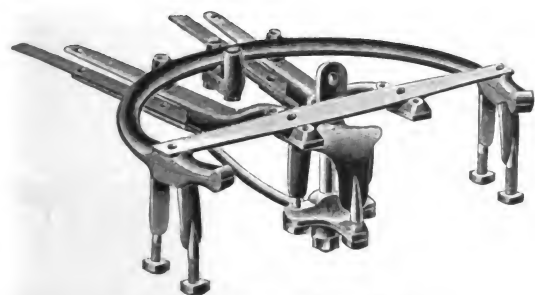


Cross Section

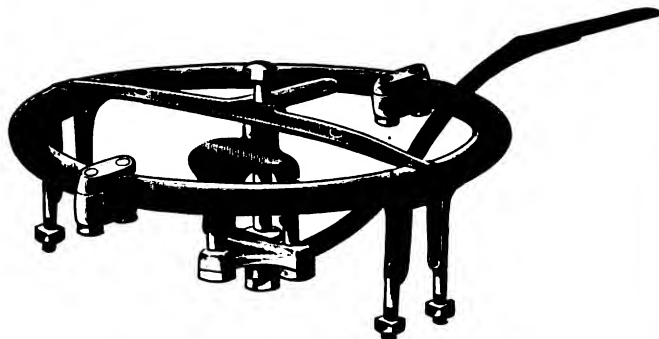
Drop Forged

Patented

S
U
R
E
S
A
F
E



No. 1905—Gear Iron

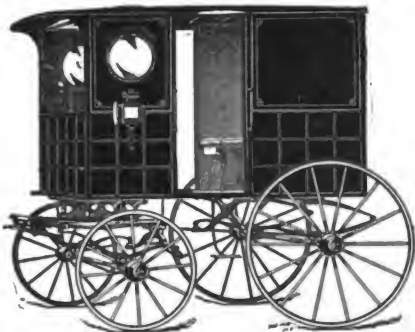


No. 1909—Concord.

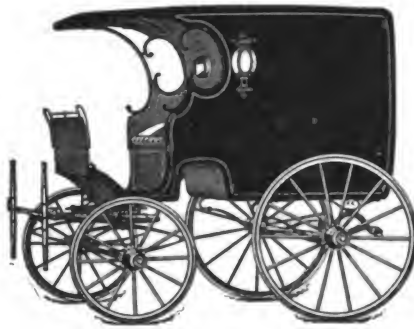
Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.



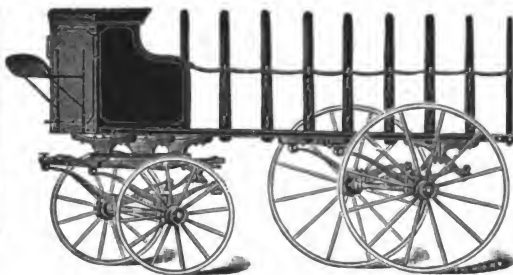
No. 112.—Milk Wagon.



No. 111.—Altman Wagon.



No. 113.—Grocery Wagon.



No. 122.—Flour Truck.

Electrotypes

of the vehicles presented on this page will be forwarded on receipt of

75 cts.

for each cut, to any address. Postage prepaid.

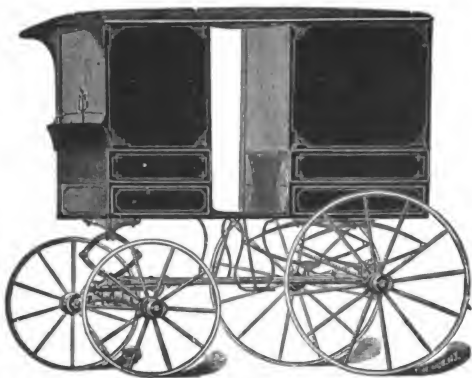
Catalogue

containing nearly 200 illustrations of carriages, wagons, sleighs, and miscellaneous cuts will be sent upon application.

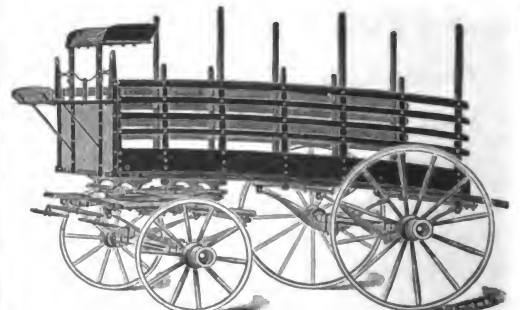
**Trade News
Publishing Co.**
24-26 MURRAY ST.
NEW YORK



No. 115.—Delivery Wagon.



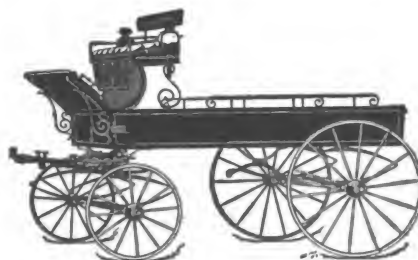
No. 116.—Milk Wagon.



No. 117.—Merchandise Truck.



No. 114.—Delivery Wagon.



No. 124.—Delivery Wagon.



No. 118.—Ambulance.

Please mention "The Hub" when you write.

The Standard Automatic Brush

Does your painting work in a New Way—better, quicker, cheaper, eliminating all waste of paint. An equal flow at all times: thickness of coat can be accurately adjusted. Absolutely clean and fireproof.

**Jobbers
and
Dealers
Wanted
Every-
where**

Complete Outfit

Consisting of a large paint tank, either stationary or movable, with automatic valve and six feet of flexible tubing, together with the automatic adjustable brush, made of aluminum,

Costs \$7.50

and it is still cheaper than the ordinary brush. The outfit is also made with a tank to be strapped on the back, which will cost \$2.50 extra.



The Standard Automatic System Does Away with the Paint Can

It eliminates the dip and is far superior to the spray, but it does rub it in. No air pressure is needed. Will work with any kind of paint. GET NEXT TO THIS NEW METHOD. Made especially for manufacturers of automobiles, automobile bodies and wheels, all kinds of vehicles, carriages, etc.

Wherever duplication of work exists, this device will increase your output and reduce the cost. Buy just one outfit to-day and be convinced. We are sure that we will have to equip your entire plant.

OUR LITTLE BOOKLET WILL TELL YOU WHY.

Write for one to-day. Send in your order. Your outlay will only be once. Apparatus will last a lifetime. Special equipments can be made to suit your purpose. Let us know what you are manufacturing and we will effect a saving for you.

Standard Automatic Mfg. Co.
50 CHURCH STREET, NEW YORK



MERITAS LEATHER CLOTH

MERITAS Leather Cloth is the most inexpensive good leather substitute made.

It's made right, to wear and WEAR.

Made in muslin, duck and drill glazed and dull, smooth and grained, in blacks and colors.

Every yard guaranteed perfect by the MERITAS trademark stamped on the back.

Look for it—at your jobbers.

Write us for sample book.

Standard Oil Cloth Co.
320 Broadway NEW YORK



THE A. BOOB WHEEL CO.
CINCINNATI, OHIO.

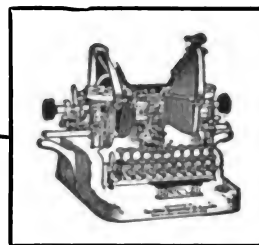
Order Your
Wheels, Poles, Shafts and Hardware of BOOB

Steel Tread Wheels, Repair Grade \$ 4.70, Standard Grade \$ 6.70
Rubber Tread " 12.15, " 15.35

We make all sizes, 9 to 4 in. Tread. We pay freight to
or factory and re-rubber your old wheels to 16 and up.
Buggy Shaft Ironed, in white \$1.40, Painted \$1.40
Per Set, (6 pr.) in white \$4.00
" Poles Ironed, in white \$3.00, Painted \$3.00
" Per Set, (6 pr.) in white \$8.00
Dry Beveled Rims, per set \$1.00. Spokes per 100, 62.00
Cushions and Backs \$1.00 ea. Buggy Toys \$0.50 and up.
Buggy and Spring Wagon Seats, all sizes.

We give 3 per cent. for Cash. Write for our
catalogue—send us a full line of Carriage and
Wagon Hardware and learn about our special
offer. Goods delivered free at your station.
Do it to-day or we both lose.

THE A. BOOB WHEEL CO., Cincinnati, Ohio



17 Cents a Day Buys The **OLIVER** TypeWriter

The Standard Visible Writer

Can you spend 17 cents a day to better advantage than in the purchase of this wonderful machine?

THE OLIVER TYPEWRITER CO.
310 Broadway, NEW YORK, N. Y.

SAMUEL W. KILVINGTON HAND-MADE

Automobile Bodies

LIMOUSINES, TOURING CARS AND RUNABOUTS DESIGNED TO
FIT ANY CHASSIS. HIGH GRADE WORK.

Estimates on Any Style Cheerfully Given.
THIRD AND WALNUT STREETS. WILMINGTON, DEL.

Philadelphia Office: AUTO TOP AND BODY CO., 257-259 N. Broad St.

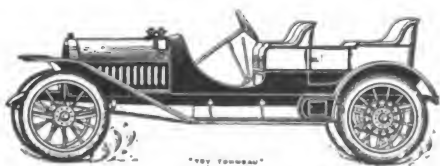
S. R. BAILEY & COMPANY, Inc.

Makers of the Celebrated.

WHALEBONE ROAD WAGON

AMESBURY, MASS.

George J. Mercer



**AUTOMOBILE BODY
DESIGNER
and DRAFTSMAN**

Body Makers' Working Drafts, Color Designs and
Scale Drawings of Pleasure and Commercial
Automobile Bodies.

Room 401

1777 Broadway, New York

TRUCK BUILDERS

If you only realized the inestimable value
of roller bearing fifth wheels on trucks, vans, deliv-
ery wagons and all other medium and heavy
vehicles, no job would leave your shop without

Roller Bearing Fifth Wheels

WHY? The adjustment is perfect. No oil or
grease required. Almost indestructible. Will out-
wear any vehicle. Saves horseflesh and prolongs
life of vehicle. Ask your jobber for the celebrated

NIELSON OR KING

Let us send you Catalogue and Price List.

American Roller Bearing Fifth Wheel Co.
745 THIRD AVE., BROOKLYN, N. Y.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

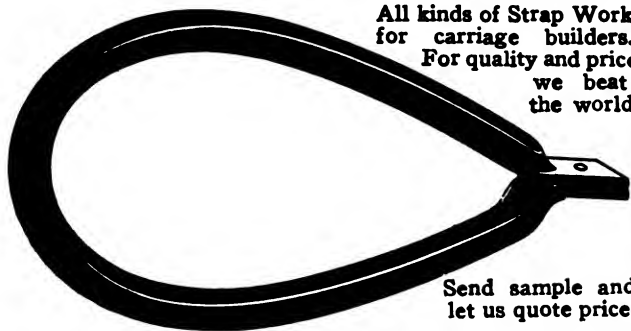
F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLOS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES



All kinds of Strap Work
for carriage builders.
For quality and price
we beat
the world.

Send sample and
let us quote prices

J. C. DECKER :

Montgomery. Pa.

J. B. KOLLER & COMPANY

Manufacturers of

FINISHED SPOKES

All Sizes for

SARVAN, WARNER, SHELL BAND AND
WOOD HUB WHEELS.

HICKORY and OAK BENT RIMS

Mechanicsburg,

Pennsylvania



BOLTS Rivets, Carriage Makers' Washers and Burrs for all kinds of Vehicles

Russell, Burdsall & Ward Bolt and Nut Co.

Main Works, PORT CHESTER, N. Y.

Branch at Rock Falls, Ill.

Time Has Told the Story!

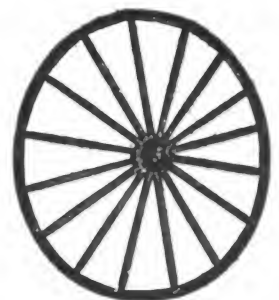
Service and satisfaction always follow our rolling stock

WHEELS

ALL KINDS—BEST QUALITY

Also RIMS and SPOKES

The Eberly & Orris Mfg. Co.
MECHANICSBURG, PA.



McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



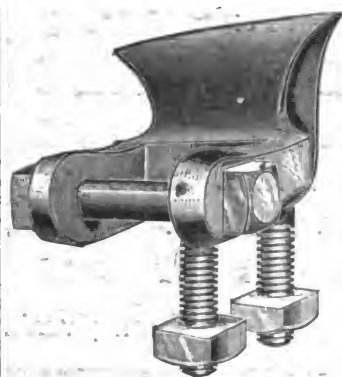
No. 334-N, with Nickel Rail.

WING DASHES

with Brass or Nickel Rails

Make the best selling vehicle

McKINNON QUALITY THE BEST



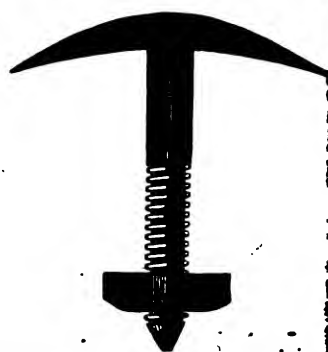
Skewed Shaft Couplings

Regular or Oval Patterns
For High Arched Axles

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



A. H. WIGGERS
Pres. and Mgr.

H. H. WIGGERS
Sec'y and Treas.

E. S. WIGGERS
Vice-Pres.

WIGGERS' BODIES

Automobile - Carriage

MERIT CONSIDERATION



Just One of Many Styles.

Because

{ THEY
HAVE
AND
ARE

{ Style
Quality
Symmetrical Outlines

{ Well Seasoned
Made to Wear
Priced Right

Address

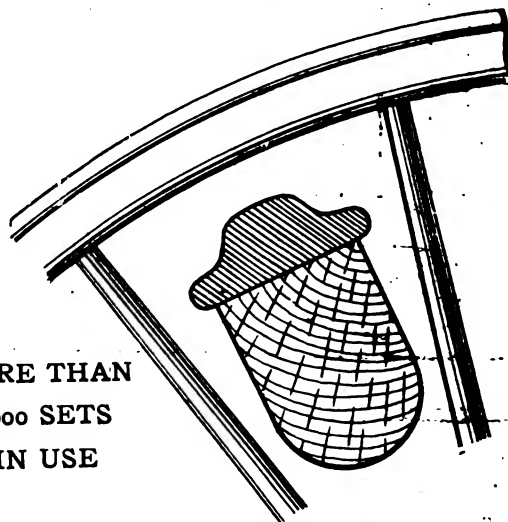
The Wiggers Furniture Co.

Manufacturers of Carriage
and Auto Bodies and Seats

1417 to 1423 Plum St.

Cincinnati, Ohio

THE BARBOUR (NEAR) STEEL TIRES



MORE THAN
10,000 SETS
IN USE

They wear fifty per cent longer than the flat, and add from fifty to one hundred per cent to the life of a wheel. Having no suction are of lighter draft in mud. Ride easier than other tires. Strike obstructions glancing instead of solid blows. Have more resistance to expansion and elongation. Cast loose stones aside instead of passing over them. Strengthens felloe between spokes. Add greatly to the appearance of a vehicle. Are moderate in price. Sold by leading jobbers. For further information write

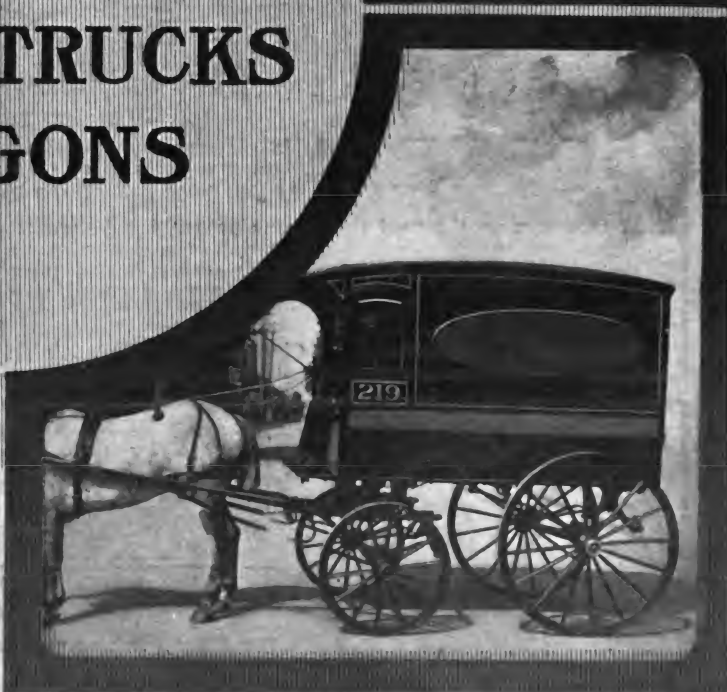
BARBOUR STEEL TIRE CO.

TERRE HAUTE, IND.

The Hub



**AUTOMOBILES
CARRIAGES
MOTOR TRUCKS
WAGONS**



TRADE NEWS PUBLISHING CO
24-26 MURRAY ST., NEW YORK

CURLEY

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN
STAR or KENNY
Sweet Concealed Band
WOOD HUB
WARNER

WHEELS

HEAVY and LIGHT
for
CARRIAGES
WAGONS and
TRUCKS

IF YOU WANT THE BEST TRY OURS



Load—Ten Tons of Coal.

SOLVED! Is the way motor car experts express themselves on the subject of tires for commercial motor vehicles after seeing and using the

KELLY-SPRINGFIELD SECTIONAL TIRE

With a grip on the road that means progress and security from the fault of solid tires—that of crowding the rubber ahead under load, which means disintegration—the motor wagon and truck owner will find in the Kelly-Springfield Sectional Tire the best tire for all heavy cars. Each section is dependent upon itself. If interested, write

CONSOLIDATED RUBBER TIRE COMPANY

New York, N. Y., and Akron, Ohio

Branches: Boston, Chicago, Philadelphia, St. Louis, Detroit, Cincinnati, San Francisco.



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT.  ACORN.  and STAR  BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO. RICHMOND, VA.

For Export Prices apply to the New York Office.



How many of your Customers' horses are **EATING THEIR HEADS OFF** ?

☞ Your customers will find out some day — why not be first to tell them that they need not use two horses to do the work that one can do in a wagon with

Timken Roller Bearing Axles

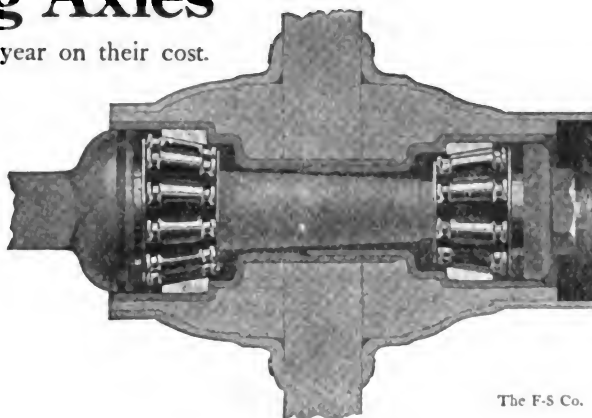
☞ *Timken Roller Bearing Axles* earn 200 to 300% a year on their cost.

They reduce draft 50%. They cut feed, shoeing and harness bills in two. They are guaranteed for two years by a big, responsible firm. And *Timken Roller Bearing Axles* need oiling only once in thirty days — thus relieving wagon users of a dirty, twice-a-week, time-wasting job of greasing.

☞ If you will be the first and most earnest advocate of *Timken Roller Bearing Axles* in your locality you will sell more wagons and sell every one at a larger profit.

Write for **FACTS and FIGURES** today -- and for Catalogue and Price Lists.

The Timken Roller Bearing Company
CANTON, OHIO



The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Please mention "The Hub" when you write.

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York, Chicago, Minneapolis, Kansas City

HOTEL LATHAM

5TH AV. AND 28TH ST.

NEW YORK

For Permanent and Transient Guests

One block from Madison Square Garden

EUROPEAN PLAN

Sample rooms for commercial men

Table d'Hote Luncheon, 50c

CLUB BREAKFAST, ALSO A LA CARTE

ROOMS WITH USE OF BATH, \$1.50 PER DAY

ROOMS WITH BATH, \$2. \$2.50 \$3. \$4. PER DAY

**A. L. PRATT
MANAGING DIRECTOR**

JOHN REILLY Inc.

Established 1865

MANUFACTURERS OF ALL GRADES OF

LEATHER

FOR THE

Carriage & Automobile Trade

PARTICULAR ATTENTION CALLED TO

OUR AUTO SPECIAL

FACTORIES,

**Avenues C & D, Murray & Astor Streets.
NEWARK, N. J.**

AGENTS,

**Cincinnati—National Hardware Co., Fourth Street
Detroit—C. W. Findlater, No. 313 Forest Ave., West**

Please mention "The Hub" when you write.

PROTEKTOL

The Modern Paint Reducer

If PROTEKTOL had been known before linseed oil, the linseed oil salesmen would have a hard time convincing users of PROTEKTOL that linseed oil is "just as good."

70 Cents per Gallon.

Write For Descriptive Booklet

Branches:

New York, Philadelphia
Buffalo, Toronto
Montreal, Buenos Aires

THE AULT & WIBORG CO.
VARNISH WORKS
CINCINNATI.

Branches:

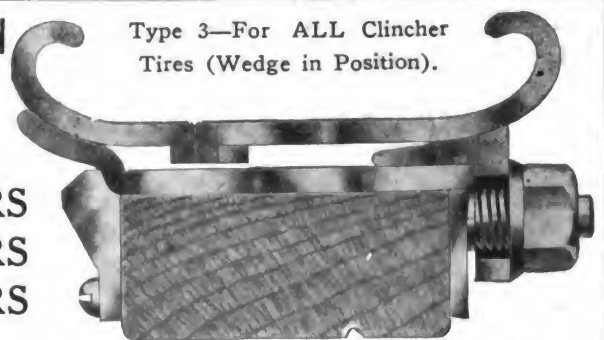
Chicago, St. Louis.
Minneapolis, San Francisco
Mexico City, London, Eng.



Type 2—For ALL Straight
Side and Clincher Tires.
(Clamp Unlocked.)

**STANDARDIZATION
OF RIMS THAT
BENEFITS**

**CAR BUILDERS
TIRE MAKERS
CAR OWNERS**

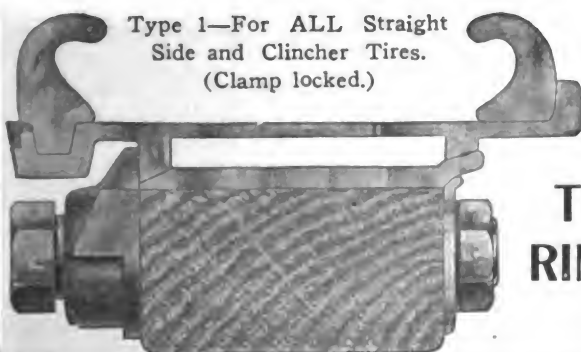


Type 3—For ALL Clincher
Tires (Wedge in Position).

The Standard Universal Quick-Detachable Demountable Rims

"FIT ALL TIRES" and SOLVE THE PROBLEM OF INTERCHANGEABILITY

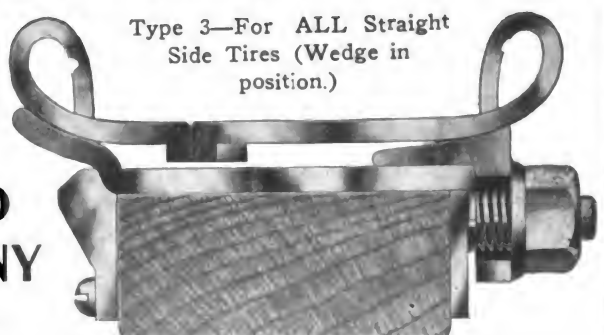
25,000 Sets of Demountable Rims and 135,000 Sets of Quick Detachable Rims; practically 96% of the total number of Rims made in the United States, have been contracted for by 100 leading manufacturers.



Type 1—For ALL Straight
Side and Clincher Tires.
(Clamp locked.)

Write for illustrated
descriptive matter.

**THE UNITED
RIM COMPANY**
AKRON, OHIO



Type 3—For ALL Straight
Side Tires (Wedge in
position.)

Please mention "The Hub" when you write.



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

¶ Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
New Haven, Connecticut

WILLEY'S COLORS

The **RECOGNIZED STANDARD**



C. A. WILLEY CO.

COLORS GRINDERS

and Manufacturers of Specialties in

CARRIAGE, AUTOMOBILE AND CAR

PAINTS

COLORS, VARNISHES, ETC.

HUNTER'S POINT, NEW YORK CITY

Headquarters for "The H. D. Smith & Co.'s" Carriage and Wagon Forgings

JACOB GERHAB

Dealer in

**Carriage Cloths, Leathers and Trim-
mings, Wagon and Cart Material**

Salable prices and all information cheerfully furnished.

158, 160, 162 and 164 North Third Street.

PHILADELPHIA, PA.

ESTABLISHED 1865

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

AUTOMOBILE WHEELS

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply any style demountable or detachable rim or tire.

THE SURPRISE IS YOURS

When You Open Your First Can of

MOORE VARNISH

Easy Working Perfect Flowing Long Lived

Highest Quality Under Every Label

BENJAMIN MOORE & COMPANY
Varnish Makers

New York Chicago Cleveland Toronto

KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

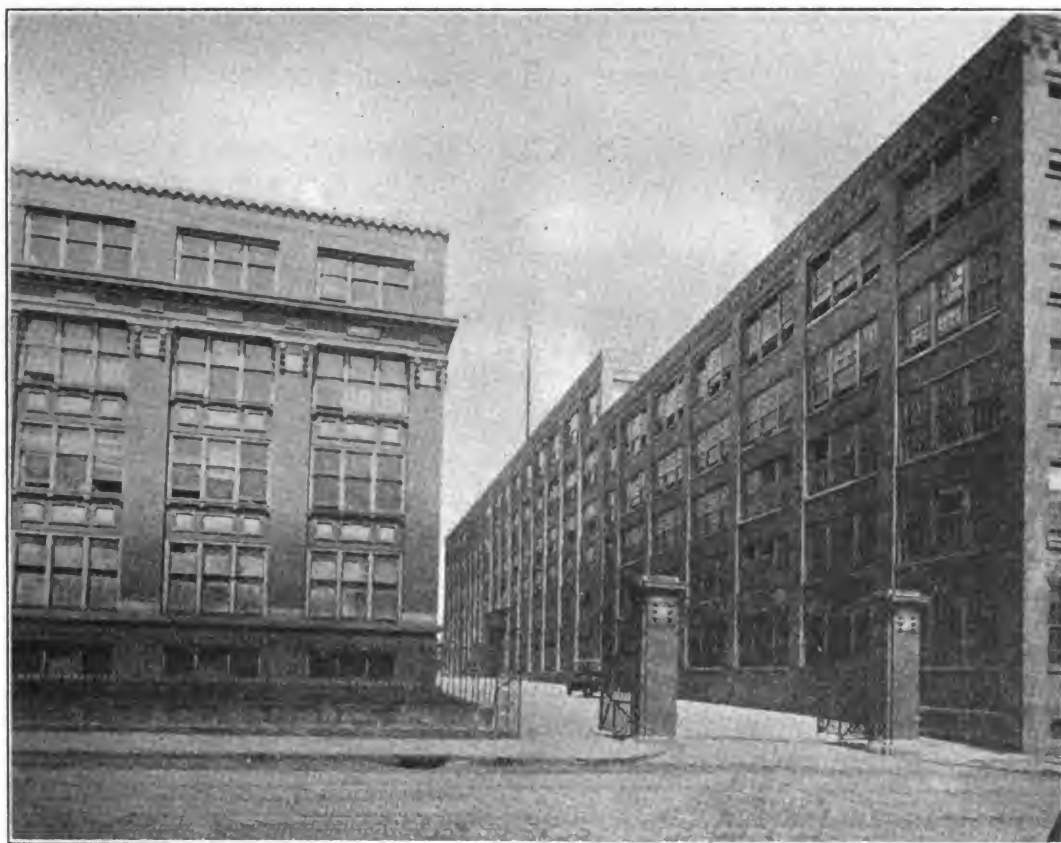
It fills the pores of Metal and Wood perfectly. Sand-papers easily and produces a fine smooth surface that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

GOODRICH "SERVICE"

The Entrance to Rubber Street



In the building on the corner (at the left) are the General Offices.

The two large buildings on the right are devoted almost entirely to the Departments of Tire Building.

The B. F. Goodrich Company
Akron, Ohio.

and
cts,
endor
anning
monious

Madison
sting, and it
the younger
y that the
unites, and
abounding
sely popu-
size of the
the expert
in urgent
to only in
quality of

improve-
the husky
it satisfy-
velness,
f var-
even

gold, ivory white, etc., as per
type of car, and with broader lines for the
full, strong coat of elastic rubbing varnish over
over this, in due season, after a light surfacing, finish
high-class varnish specially designed for motor car work.

Motor Car Varnish

Apparently a good carriage varnish should prove a good motor car varnish, but it doesn't always prove to be such. When reaching a conclusion with respect to the utility of a carriage varnish for motor car purposes, it is important, in the first place, to bear in mind that the car surface is exposed to a more exacting and destructive form of service than obtains in any usage given the horse-drawn vehicle. The vibration of the surface, for instance, is very great, as a rule, upon the motor car. Surface strains are severe and constant. The care-taking is, for the most part, about of the worst. Neglect of the essential things calculated to promote the efficiency of the varnish upon the car is widespread. Users have not thus far grown wise to the fact that it pays from every angle of consideration to take the best possible care of the finished car. However, all these factors must be worked out, and a straight-forward reformatory step taken before we may hope to get the normal carriage varnish service from the motor car finish. The first corrective step should be to buy a varnish adapted to the peculiar and special needs of the motor car. Then buy the best varnish, ignoring the question of price completely. Then, to your customers, preach the gospel of the best possible care of the car.

From Carriage Monthly, April, 1911.

THE DIFFICULTIES

of Automobile work are well set forth in this extract from a trade journal

VALENTINE'S VANADIUM VARNISHES

were prepared and introduced to overcome them and their

Success has been Demonstrated

There is no need to face risks or disappointments

USE VALENTINE'S VANADIUM VARNISHES VALENTINE'S VANADIUM COLOR-VARNISHES

VALENTINE &
COMPANY

VALENTINE'S
VARNISHES

New York Chicago Boston
Toronto Amsterdam



The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE

Tires set cold
in one minute.
This machine
saves time —
does the work
better and quick-
er, does away
with burned
streaks. Only
necessary to
measure one
wheel in a lot.
Does not char
the rim and

thus make the tire loosen prematurely. Saves re-sandpapering of wheels.

This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO., ROCHESTER, NEW YORK

Jones Wheels

BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.

Newark, N. J.

MOLLER & SCHUMANN COMPANY

COLORED RUBBING

Most perfect as to working, drying and wearing.

CARRIAGE & AUTO VARNISHES

Send for color card and descriptive price list.

Chicago Branch - 110 N. Desplaines St., Office and Factory - BROOKLYN, N. Y.

Please mention "The Hub" when you write.

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

MAY, 1911.

NO. 2

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, *President.*

G. A. TANNER, *Secretary and Treasurer.*

24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00

AMERICAN HARNESS AND SADDLERY

DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Chronic Price Cutting Matter of Habit.

The headline expresses the opinion of a maker of automobiles who gravely reprehends the practice. It is only now that such subjects as price cutting seem to be worth comment. It is no longer a study to just produce the work fast enough to supply the demand, but it becomes a problem how to market it well. This brings a new set of thinkers in the seats of the elect, and they have new thoughts well expressed, and full of the philosophy of experience. We liberally quote from one such recent speaker as he philosophizes on chronic price cutting. The application is general.

Chronic price cutting is largely a matter of habit. Like the drink habit if it is persisted in, it almost invariably results in the undoing of the person who indulges in it. It is somewhat similar to the drink habit, inasmuch as some persons can quit the price-cutting habit by ordinary determination and will power, while others require the commercial Keeley cure—that is to say, bankruptcy. Price cutting is not salesmanship, nor is it competition. It is a part of what is sometimes called unintelligent competition. Unfortunately, not even the buying public gets any benefit from price-cutting, and in the case of automobile buyers, the purchaser of a cut-price car usually gets the worst of it in the long run. In this connection, the term "price-cutting" must not be confounded or confused with legitimate reduction in

prices. Price cutting, strictly speaking, is the antithesis of the one-price system, and can always be distinguished from legitimate price reduction by the application of the rules of the one price system. The one-price system does not mean the same price for the same article forever, but it does mean the same price to all buyers, so long as general change in prices is not desirable or necessary. If a list or selling price is too high or yields an unreasonable profit, the price should be reduced, either by a percentage from list prices or a reduction of the list price, but when the reduction is made, it should, practically speaking, apply to all.

Putting on Brakes.

It has been plain for quite a while, much before there were any distinct indications, that there had to come a slowing down of business.

Now that the results are showing there are many explanations presented, and they all have a bearing on the fact.

The main interest ought to center in the probable length of time required for the liquidation. If it is orderly and quiet it will be slow and not so very burdensome, but somewhat tedious. If it should become accelerated, panicky conditions usually follow, and the readjustment is painful, but soon over.

We already note a very significant falling off in the amount of imports, one of the best signs that economy is becoming fashionable. If this good symptom is not offset by the uncommonly large amounts of money that will be distributed in Europe this summer, especially by tourists, it will powerfully help to right business conditions.

We are an enthusiastically optimistic body of traders, and we always are inclined to go to extremes, especially on the expansion side of the proposition. We pay for this great speed and progress by healthful and very essential periods of liquidation at intervals more or less constant in the line of their recurrence.

There is at present so much good counsel being tendered that we may get through the present period of depression nicely, and without taking a too drastic remedy.

The Lumber Census.

Some of the interesting facts of the census are beginning to come out. The production of lumber, for instance, puts the state of Washington at the top. This is in the line of the expected, but it is curious to note that Louisiana is second in production.

In the grades of wood in which we are interested we find that oak is third from the top in volume of production. Red gum follows eleventh in order, and then comes

basswood, sixteenth; elm, seventeenth; cedar, eighteenth; hickory, nineteenth, and ash twentieth.

The hickory supply is drawn upon heavily by the carriage and wagon industry, the stock for which is often cut directly into special forms, so that reports of hickory lumber production are somewhat misleading. Nevertheless, the great increase in the reported cut of hickory lumber in 1909 shows the heavy drains that are being made upon the remaining stands of this uniquely valuable wood.

The oak production reported in 1909 was slightly less than that in 1899. If the canvass of 1899 had been as complete as that of 1909, a much greater production in the former year would undoubtedly have been shown than was reported, so that it can be safely said that the total cut of oak is decreasing.

The production of elm is decreasing, the output in 1909 being only 76 per cent of that of 1899.

The hickories are widely distributed throughout the eastern half of the United States. Reports of hickory lumber production in 1909 were received from 7,796 mills located in 34 states.

Tennessee ranked first in the production of hickory lumber in 1909, with a product of a little more than one-sixth of the total. Arkansas produced about one-seventh, Kentucky one-eighth, and Missouri one-tenth of the total. The four states named together contributed more than one-half of the entire production.

There is a great demand for hickory lumber, and the available supply is limited. Consequently, the price in 1909 was the highest yet reported.

Six-Cylinder Work.

The Packard car makers have announced a six cylinder model, "model" being a term that presages a new style of body on an unchanged underbody.

The Packard is one of the three Brewsters of the automobile trade, so it is supposed to be an event if the builders "announce" something.

The engineers of the company had supplied in time past cogent, scientific and exhaustive reasons why the six cylinder construction was more or less of a silliness, so if the present about face of position does not cause the judicious to grieve, it makes the light-minded guffaw.

The Winton Carriage Co. is not so prone to "model" as others, and it has steadfastly built only six cylinders for reasons that have been advertised. Let us call it the pioneer, whose motto is "I told you so."

Advertising by Proxy.

An English publication, *The Commercial Motor*, has put its editor to an utilitarian use for the benefit, vicariously, of all who make motor trucks.

The brilliant editor, Mr. Smith, but for means of better identification, Mr. Shrapnell Smith, is in the act of scattering shrapnell among many industries by means of writing articles which the trade proponents of those industries publish.

For instance the Cabinet Maker and Complete House Furnisher (10,090 guaranteed) has invited Mr. Smith to its hospitable columns for one, others follow:

Great possibilities are here indicated, and developments of far-reaching importance foreshadowed. From the standpoint of the motor manufacturer, it is financially out of the question that he should often have business announcements in journals which admittedly go exclusively and straight to the members of particular industries. Huge cost is one bar. Other drawbacks, in pre-existing circumstances, have furnished good reasons for abstention, not the least of these being editorial inability to advise or convince a potential buyer.

Why does not this open up bright prospects in this country. Why could not the motor tract makers entice the editor of *Automobile* to spread some of his pure engineering fancies before the readers of the *Pharmaceutical Record* (unlimited guarantee), and by showing the square root of the advantage of using motor trucks for quick delivery of prescriptions, widen the sales prospects, and thus not put it "financially out of the question" for the truck builder? We hope this suggestion may not fall on stony ground.

It Makes the Reader Feel Good.

Our well-printed contemporary, *The Carriage Dealers' Journal*, displays conspicuously the following as a first page "head."

"A GOOD FISHING SEASON.

"Business Prospects Are Alluring—The Wide-awake Dealer Should Do Well in 1911—Plenty of Money
—A Good and Growing Demand—The Feeling of Confidence Spreading Fast."

We think its readers would write a different head, and they would prove themselves better editors in so doing. Some of the people some of the time, yes, but not all the people all of the time.

R. I. P.

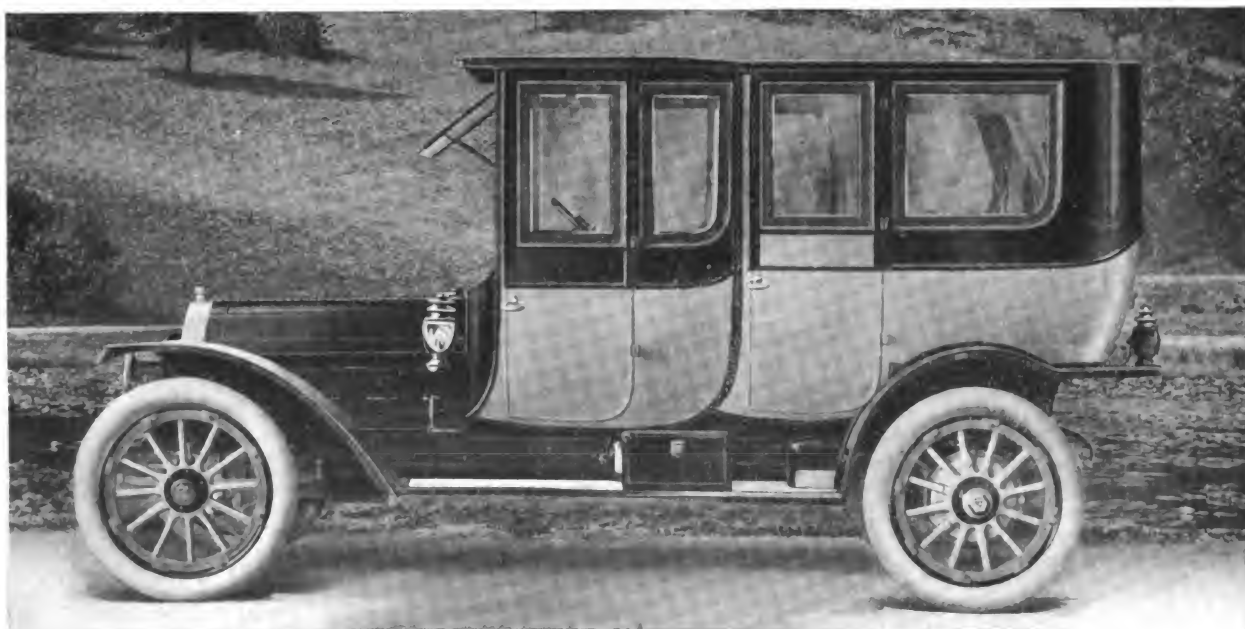
The *Carriage Monthly* announces the submergence, which amounts to the discontinuance, of the *Vehicle Dealer*, within the pages of the *Monthly*. That makes two journals resting in peace in the limbo of the has-beens. The *American Vehicle* was the predecessor.

Decline in Imports.

A decline in the importation of manufactures and in many cases also in materials for use in manufacturing is the leading characteristic in the March import trade of the United States, as shown by the figures of the month's business just completed by the Bureau of Statistics, Department of Commerce and Labor. Goods of all kinds, especially champagne, cigars, diamonds and other luxuries show a decline in March, 1911, values when compared with March, 1910.

While a truth is a mere appearance, or belief on the testimony of others, men can contend about it, but when it gets rooted in the heart and is imbued with the light of heaven there is no ground for contention.

Vehicle Fashions for May 1911



STEVENS-DURYEA MODEL "AA" SIX-CYLINDER "BERLINE."



STEVENS-DURYEA MODEL "Y" SIX-CYLINDER LIMOUSINE.



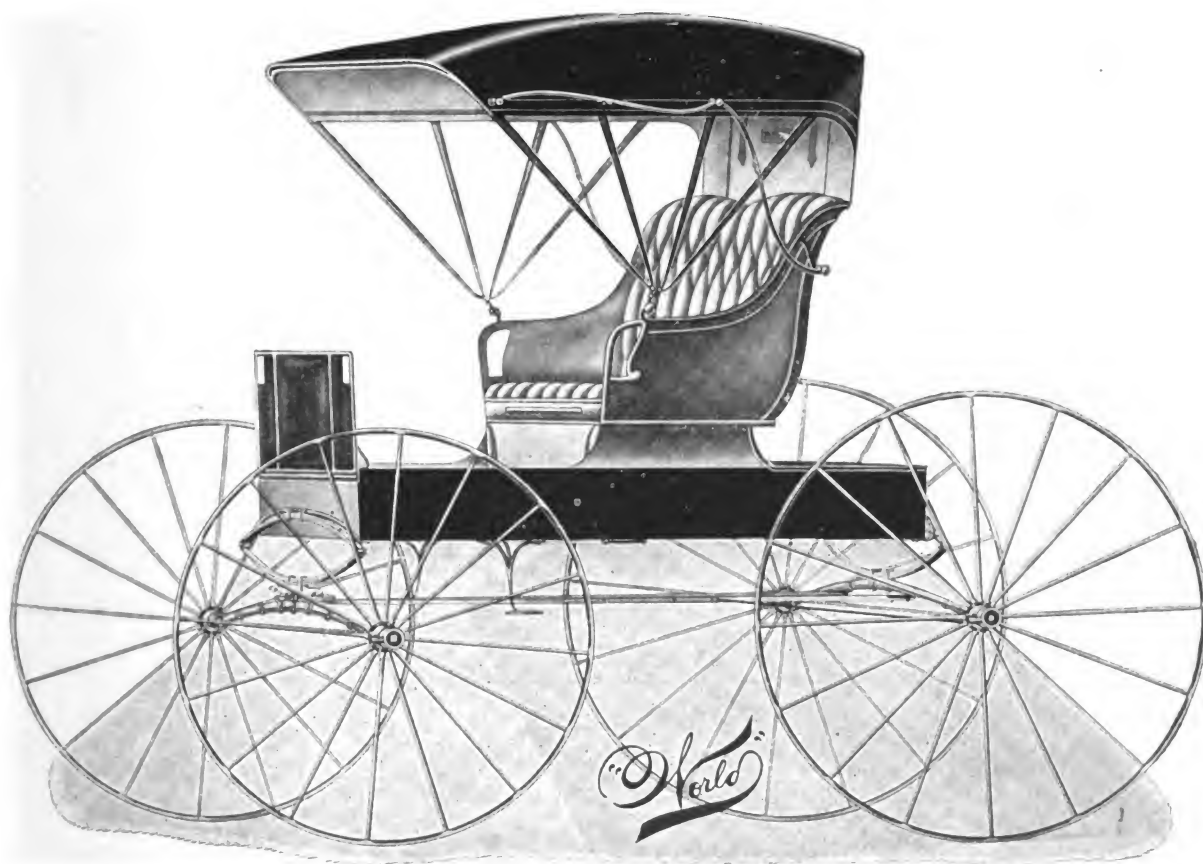
INTERCHANGEABLE SLEEPING-TOURING FRANKLIN CAR.



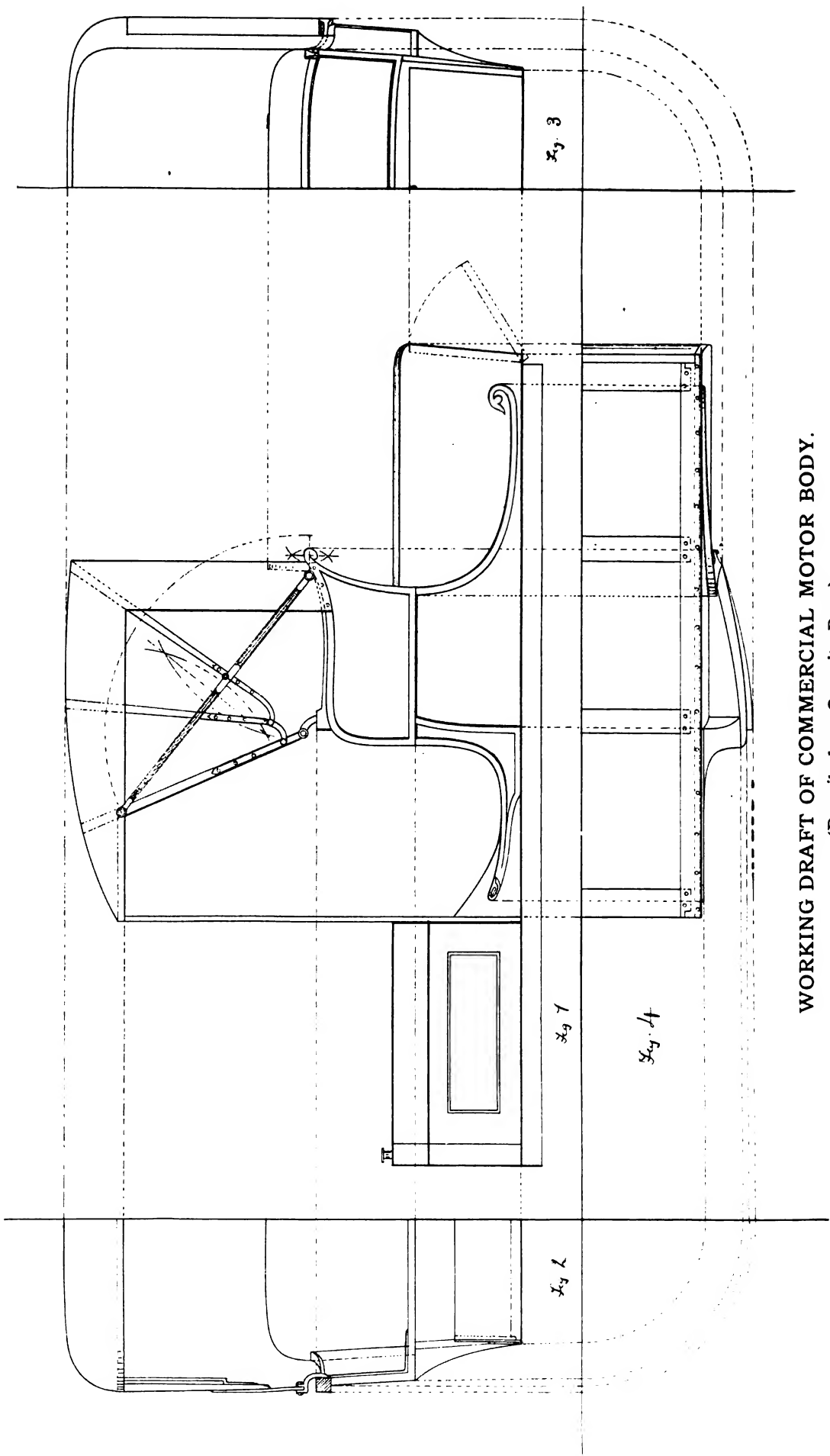
FRANKLIN ONE-TON TRUCK.



BUFFALO BILL'S WILD WEST SHOW CAR
Built by Martin Carriage Works.



AUTO SEAT SPECIAL BUGGY
Built by the Studebaker Corporation.



WORKING DRAFT OF COMMERCIAL MOTOR BODY.
(Described on Opposite Page.)

Wood-working and Smithing

WORKING DRAFT OF COMMERCIAL MOTOR BODY.

(Illustrated on Opposite Page.)

The purely commercial car, to be used by commercial travelers, apparently has not received much inventive thought.

Now with the aid of the motor as a road vehicle, the most remote locality from the seat of railway communication can be reached with comparative ease and quickness, and with a cost quite within the margin entailed by a horsed vehicle, or railway and horsed carriage combined.

In the working draft of a commercial traveler's motor, which is given here, it is sought to provide sample room in the back of the body, also for the carriage of small parcels of sufficient value to warrant their delivery by motor, as is done in horse-drawn vehicles built for this purpose, while the front seating is fitted with every need as to driving comfort and the protection of a canopy hood.

The body is built in a plain but strong way, and fitted in the rear part with all the shelving needs peculiar to the business it may be required for; it is covered in on the top and fitted with a lock-up door behind. The front top quarters are framed and paneled, the mouldings being worked up in the solid. The boot sides of the body are $\frac{7}{8}$ -inch stuff and half check framed to the bottom sides which are screwed to the side from underneath.

The front pillar is piece framed from underneath the seat; that is, the projection of the seat at the front pillar is filled with a pillar piece, which is boxed out to the line of the mouldings and worked round to a bracket scroll and finished with a carved eye. This is a much simpler way than making the pillar in one, and fitting the side to it as is done in a stanhope body. The corner pillar scroll piece is also fitted level with the projecting part over the side, as shown on the back in Fig. 3, and on the half plan Fig. 4. The solid side is carried forward and forms the bracket foot-board line, the bracket scroll being planted on in line with the pillar piece.

The top of the back of the body is made rounding to run the water off, and the back paneling set out to harmonize as explained in Fig. 3.

The hood is fitted up with three slats, while the front horizontal slat is held in position with a boss eye, swivelled to the inside hinge plate. The boss works up and down a rod fixed to the inside of the first slat, the working of which has been several times fully explained in *The Hub*.

The slat hinge plate feet are screwed from the outside and are invariably silver plated, which looks better than the slats standing outside of the feet. The outside head joints are made straight, and are centered as set out in the elevation. The head covering is of fawn colored waterproofing, which is lined off to position on the quarter and on the top. The covering goes right across the back and a celluloid light is fitted to the back covering.

The body is built on very elementary lines, and is of a style that will readily appeal to the commercial instinct for which it is designed.

The sizes of the body are: Length on chassis, 6 ft. 7 in.; depth of hind boot, 17 in.; rise on top, 1 in.; length of back of body on top, 34 in.; depth of side in front, $14\frac{1}{2}$ in.; depth of front quarter on pillar line, $12\frac{1}{2}$ in.; at back, 16 in.; length on seat line, 22 in.; on elbow to pillar piece, $23\frac{1}{2}$ in.; from dash to seat, 24 in.; length from bottom of pillar to dash, $26\frac{1}{2}$ in.; depth of neck of bracket, 3 in.; depth in front $4\frac{1}{2}$ in.; width across body on bottom, 33 in.; across seat over pillars, 44 in.; on top of pillars, 46 in.; over head, 48 in.; width across head horizontally 4 ft. 2 in.; width of horizontal front slat, $14\frac{1}{2}$ in.; depth from seat to top of

head, 4 ft.; depth of round from the horizontal line, 8 in.; width of hind boot on top, 36 in.

There is an unlimited future for the small car, either as a business vehicle or as a pleasure seeking agent. The direction of engineers and inventors is to provide mechanical self-feeding lubrication, and the burning of lubricating oil, to kill the throwing off of fumes which are so offensive to those on foot who are passed by the speeding motor carriage.

TEMPERATURE—WOOD.

Wood is such peculiar stuff, and is so sensitive to every change of temperature, that it is quite a study to learn just how to use it and not have any trouble with it.

We had an order for tables, 6 feet by 2 feet, tops to be white wood—and, by the way, we pay \$70 per 1,000 feet for white wood where I hang out. The tops were to be all deeply scored in 1 in. squares, the scores or saw cuts to be filled with some black cement and then the top sanded off perfectly smooth, leaving the 1-in. squares white and clean and the lines black and hard.

We took lampblack and glue and spread over the entire top, rubbing it well into the scores, filling them up, and set the tops away to dry. This was done on Saturday, and by Monday morning those tops were all curled up so they would have made splendid canoes by stopping up the ends. Now, one would naturally suppose that putting the wet glue on one side of those tops, the material in which was perfectly dry, swelled that side and made them crowning on top, but this was not the case at all, for the glue dried without swelling the wood, and protected the side covered with the glue from the atmosphere. Then the building, not being quite so warm on Sunday, swelled the bottom side of the tops and they looked like a lot of eavestroughs on Monday morning.

We had those tops placed on the coils in the caul box. This straightened the most of them out again, and as fast as one would straighten out we sanded it off and put it on the frame, screwed and glue-blocked it down, and gave it a coat of filler on both sides to prevent any further contortions.

Strange to say, not a glue joint started in any of the tops. A few of them were obstinate and would not come back, and, more by way of experiment than anything else, we put water on them. This brought them back in short order, and as soon as they were level we wiped them off, dried them, and, after sanding, found them as good as the others.

SIZES IN SHAFTING.

Since the introduction of electrical transmission, says *Wool Worker*, there has been a tendency toward lighter weights in shafting. It was but natural, in changing from the old, heavy, cumbersome cast shafting, and later the wrought iron shafting, over to steel shafting, to take lighter weight and get more strength by superiority of material. To take a very light shaft and mount a pulley with a heavy belt pull midway between two distant journals, is to invite trouble and to produce more friction than would result from the use of a heavier shaft which would not deflect much under ordinary strains.

The use of light shafting is commendable, but it should be handled with discretion as to locating pulleys and journals. When light shafting is loaded with pulleys there should be a journal close to each pulley, and very little hanging of pulleys midway between journals that are from 4 feet to 8 feet apart. Even a large shaft will spring with a tight belt pull under conditions of

that kind. It is perhaps a good idea to figure out carefully the shaft strain and use the lightest practical shafting for the work, then use more journal boxes on it, also distribute the journal boxes so that there does not come any belt pull in the middle of a long reach. Each belt should be alongside a journal, and if it is a heavy pulley it is preferable to have a journal each side supporting the shafting. By following out this idea carefully it is practical to reduce friction materially these days, through the use of light, high-grade shafting.

HARDENING AND TEMPERING TOOL STEELS.

Carbon tool steels are usually made in six distinct brands or "tempers" for different kinds of tools. The temper is a measure of the hardness, which varies with percentage of carbon. The quality or grade of a steel has no relation to temper, since every temper is made in different qualities or degrees of purity. The six tempers range from the highest, containing $1\frac{1}{2}$ per cent of carbon, to the lowest, containing $\frac{1}{4}$ per cent. For ordinary lathe and machine tools, the carbon content ranges from 1 to $1\frac{1}{2}$ per cent carbon, some of the finer cutters having $1\frac{1}{2}$ per cent of carbon.

Tools of carbon steel have to be heated the more carefully the higher the carbon content, and the finer the edges of the tools, as in the various toothed cutters. Steel of these grades must not be overheated, or reheated more often than is necessary for forging. After forging they should be re-heated to a cherry red and allowed to cool slowly before hardening or tempering is done. The re-heating and slow cooling is more necessary in the case of cutters than of the single edged tools for lathe and planer.

For the pure carbon steels there is a temperature above which the various "tempers" should not be heated for forging, hardening or annealing. For the usual six tempers these are as follows:

Carbon		Maximum Temperature	
Per Cent.	Maximum Color.	Cent.	Fahr.
$1\frac{1}{2}$	Cherry red	About 800°	or 1,440°
$1\frac{1}{4}$	Bright cherry red	" 825 "	1,485
$1\frac{1}{2}$	Red	" 850 "	1,524
1	Full red	" 875 "	1,575
$\frac{7}{8}$	Bright red	" 900 "	1,620
$\frac{3}{4}$	Full bright red	" 950 "	1,710

For all these the point at which the carbon changes its state (the critical point) is 680° Cent. (dull red) in letting down, and 700° Cent. (dull red) in going up, at which temperatures the steel assumes the maximum hardness of which it is capable. But the scale which forms on the surface forms a blanket so that a higher initial temperature of about 100° Cent. must be imparted. Forging should not be done at a lower temperature than about 565° Cent. or 1020° Fahr. (a brown red). The effect of the lower temperature would be the setting up of strains and flaws.

Tempering colors are as follows:

Heavy lathe tools, etc.—Light straw.

Ordinary lathe and planer tools—Straw.

Taps, drills, etc.—Dark straw.

But the color tests which have been usually given for temperatures for forging, hardening and tempering tools of the ordinary pure carbon steels are too vague and too general to harmonize with modern requirements. The period of so-called "guesswork" or of "rule of thumb," even though these are the result of much experience, is being discountenanced in the modern class of works. Unassisted practice is perfectly reliable when the tool-smith has had plenty of experience. But there are so many steels, and every brand differs in the shades of treatment which should be meted out to it to secure the best results, that the pyrometric method of testing temperature, and the employment of special heating furnaces are displacing the old practice. It is right to know and employ exact temperatures because the best results are only secured within a range of a very few degrees on

each side of the critical temperature, which, as just stated, varies with every brand of steel.

Hardening and tempering are either done in two distinct operations or in two stages of one operation. The first is adopted when the tools have to be of the same hardness throughout, the second when the body or shank should not be so hard as the cutting end. In the first case, the tool is heated for hardening, and quenched wholly until cold. A surface is then polished, and the tool reheated on a hot plate or bar until the color required appears. In the second, the tool, after being heated, is partly quenched by the insertion of its working end in the hardening fluid. On withdrawal, the end is polished with a piece of stone, and the heat returning from the body or shank soon indicates by color when the tool should be wholly quenched for tempering. The following summarizes the treatment to be given to the carbon steels:

When hardening, care must be taken to heat up evenly, otherwise cracks or fractures will result, or hard and soft places. Quenching must be done in a large volume of liquid, as a small quantity will not carry off the heat from the tool quickly enough. Slowly running water is therefore desirable, as still water gets hotter with successive hardenings or temperings, and its effect lessens, until, at an extreme stage, steel can be partially annealed by plunging it at a red heat into hot water. And to reduce strains in tools which have to be hardened all over, a good plan is to plunge them in the water bath, and when the cutting edges are black, draw them out quickly and plunge into a tank of hot water or into an oil bath, the object being to remove hardening strain.

The kind of water used for hardening exercises a vital influence on results, says English Mechanic. Some waters will not harden at all, others but indifferently. Distilled water is best, and it may be collected from exhaust steam pipes. Soft water is better than hard. Acidulated waters are liable to render steel brittle and cause cracking. The presence of greasy matters and dyes will often prevent hardening.

When gripping hot steel, the tongs should not be cold or damp, but be heated to a black red, otherwise the steel may be cracked. They should grip as little of the tool as possible.

In the treatment, therefore, of carbon steels, forging should be done at the lowest temperature suitable for a given brand, which occurs at a low red or brown heat. Overheating injures the quality, induces cracks, and is revealed by a bright crystalline fracture instead of a fine silky one. As few re-heatings as possible should be given, for hardening, heating up to the proper temperature must be done slowly, evenly and thoroughly. Scale produced in forging or annealing must be removed before hardening. If quenched in water the temperature should not be below 60° Fahr. (16° C.), and the supply should be ample. Salt added to the water imparts greater hardness to the tool. Oil or tallow are used for quenching when toughness is required more than great hardness. For tempering, the hardening tool is let down to the color corresponding with the temper required.

SOMETHING ABOUT GLUE.

Half-truths, mistakes and plain fakes make up the larger part of the glue lore we meet around in factories and shops, and dollars wasted because the truths about glue are not known. The remedy is knowledge.

The chief benefit will be the safeguarding of the glue work by the improvement in the quality of the work produced, and that is of more value than reduction of the glue bill.

It is not a question of brand or grade of glue, but a question of methods and knowledge. Get better methods and more knowledge and apply these to the problems, and instead of groping guesswork there will be certainty, uniformity and no more glue problems to worry about.

The resistance of a joint against a force applied to pull it apart depends, says "Glue," upon the strength of the material of which the bond that holds the surfaces together is made; in our

case the glue. The pulling apart of a joint means the tearing of the glue bond. What we should do is, therefore, to determine the tensile strength of the glue itself, and that we can better do if we deal with the glue only; to deal with the glue through the medium of a joint means to complicate matters. From the tests made on glue specimens it has been established that the tensile strength of glue runs from less than 2,000 pounds per square inch for the low grades, and up to 16,000 pounds or more for the high grades, or that some glues may have eight times as much tensile strength as others. Natural then, that the strength of the glue is the factor which will influence a joint test the most.

The same glue will not give the same joint strength on any kind of wood; the figure will be higher on some and lower on others. Usually it runs this way, that the medium and the low grade glue show the greatest variations in their joint strength, while the high grade glues vary less. Still greater is the variation in the joint strength produced by the vegetable adhesives on various kinds of wood. For these reasons it is necessary to specify the wood and to use the same kind of wood for all tests. For the purpose of demonstrating as clearly and plainly as possible how much the joint strength varies in different grades of

liquid had a chance to lay hold on the wood surface. But with the present kiln-dried lumber and steam heated workrooms the heating of the lumber before gluing can in many cases safely be reduced and in some cases entirely be omitted.

One thing is certain, heating as now done in many cases is excessive, the stock often so warm that handling it with bare hands is not agreeable.

If the stock has enough heat to keep the liquid glue from jellying the moment the glue is applied, that will be enough to make it possible for the glue to perform its function. A temperature of 100 degrees F. (around blood heat) suffices for this purpose; as high as 110 F. may be allowed, with 120 F. as the extreme limit.

ELECTRIC MOTOR EQUIPMENT OF WAGON WORKS.

It has been found by the Parr Wagon Works, that an electric motor drive is very much more economical than the steam drive which was formerly employed at this plant, according to Wood Craft.



Woodshop of the Parr Wagon Works.

animal glue, good hard oak has been found to give the best results.

It is not unimportant whether the glue layer is light or heavy; if the bond is light, the strength is lower than if the bond is ample. If much glue has been applied and the glue was thin, the bond would be light, because the major portion of the glue was drawn too far into the wood. The body thickness of the glue and the porosity of the wood will determine whether there be a light bond and a heavy absorption, or an ample bond and little absorption.

This custom of heating the object which is to be glued dates back to the times when all stock was air dried, and when the workroom was more or less open and poorly heated. Under such conditions the heating of the stock was a necessary precaution, because this heating by driving out some of the moisture in the wood raised the receptiveness of the wood for liquid glue, at the same time preventing the chilling of the glue liquid before this

The load factor, figured on a basis of 240 hours per month, averages only from 10 to 15 per cent. Since with motor drive, very little machinery need run idle, the friction loss ordinarily incurred with line shaft drive is practically eliminated; that is, power is developed only while useful work is being done, and then only in proportion to the work done.

During a large part of the time some of the machinery in such a shop must necessarily be idle, and if driven by motors, the individual machines or groups of machines can be easily and quickly started when their use is required and stopped again as soon as the job is completed.

When the wagon shop was changed from steam drive to group and individual motor drive, the line shaft in the wood-working department was divided into three sections. Each of the two sections is driven by a 10-horsepower Westinghouse type C squirrel-cage motor running at 840 revolutions per minute, and the other by a 15-horsepower Westinghouse motor of the same type and

speed. Each motor is belted to a line shaft with a 3 to 1 pulley ratio reducing the line shaft speed to 280 revolutions per minute, which is about the standard for woodworking shops.

To the three line shafts are belted 21 different machines, including a pony planer, a double-spindle shaper, a jointer, tenoning machines, drills, etc. In addition there are several individual motor drives in the blacksmith shop, which bring the total power to 53 horsepower. The three motors on the line shafting have been in use for the last five years, and during this time have required no more attention than an occasional oiling; it has not been necessary to spend a cent for repairing them.

The Parr Wagon Works employ about 30 men and have a capacity of from 900 to 1,000 farm wagons a year. Everything with the exception of the axle-skins, is made at the works, and the wagons are shipped complete.

Machines and method of drive at Parr Wagon Works:

Individual Motors.

Machines.	H. P.
Tire Bender	3½
Drill presses (2)	each 2
6-inch trip hammer	2
6-inch punch and shear	3
Double emery wheel 6x1½ inches	½
Elevator, belted type	7½

Group Drives.

15 H.P. Motor—24-inch single surfacer; 19-inch cut-off saw; 16-inch rip saw; small turning lathe; small engine lathe; 25-inch pony planer; sander.

10 H.P. Motor—Band saw, 36x½-inch; automatic turning lathe; 16-inch jointer; double spindle shaper; hub-tenoning machine; mortiser.

10 H.P. Motor—Facing machine; two drills; tenoning machine for spokes; skein fitter; emery wheel, 24x2 inches; hub press; hub barring machine.

FIRE PREVENTION.

Perhaps the greatest bugbear of the owner whose factory is not of the modern concrete fireproof construction, is the ever-present fear of fire. There has resulted on account of this fear and the desire to lower insurance premiums, the investment of thousands of dollars in the installation of sprinkler systems and their maintenance. Such a tremendous investment is but a small part of the cost of fire inspection, the maintenance of other equipment and the pay and organization of private fire companies.

Now the primary object of all this expense is the reduction or elimination of the possibilities of loss or damage by fire. In order to receive reasonable rates for insurance, it is necessary to make the property to be insured a low risk, to reduce the liability of its burning by such construction and protection as will tend to retard fire or put it out.

There are those who, because of small investment and flimsy construction, do not insure, and there are many of these who luckily save the cost of their building in insurance premiums in the course of a few years. Over against this class, however, are those of the same class who do not come out so easily and who lose their entire investment from an uninsured fire loss.

A little planning at the time of building will do much to secure a low insurance rate, even on such an inflammable risk as a carriage factory is almost certain to be. The location of fire walls, with openings protected by fire doors mounted on inclined tracks so as to make them self-closing when released, and which can easily be held open by a floor latch when desired, will often mean the segregation of the fire in one section until it can be extinguished. Even in a wooden building, if there are one or more such partitions, covered on both sides with sheet iron, painted or galvanized, it will often mean only a small instead of a total loss.

To prevent spreading from floor to floor, as there is always a tendency to do, it is well to have stairways and elevators in

walled-out areas, connecting with the different floors, through fireproof doors that can be closed in emergency and which should always be closed except in working hours. This will eliminate the spread of fire through these large openings, and while with line-shaft drives it is impossible to avoid a great many small openings through floors, for belts, still, fire will not spread through these nearly so quickly as through the larger openings. With the increase in electric drives, these small openings will gradually become a thing of the past.

In the construction proper of wooden factory buildings or of brick buildings with wood joists and interior, if the joists are heavier and spaced farther apart, and the use of bridging is not required to keep them steady, much less studding surface will be presented to fire attack, and much more damage can be done before the joists give way and let down the floor. When a common 2-inch joist has burned completely through, the 4-inch or 5-inch has not yet been weakened dangerously. The floors for factory use can be made of a heavy 2-inch or 3-inch planking laid one way, and a light hardwood surface laid angling to this. This not only furnishes a substantial, hard-wearing surface for trucking, but effectively shuts off the draft up through cracks that so much accelerates the burning of supporting joists.

Besides these general items, there are others which cannot be said to be strictly fire preventive, although their tendency is in that direction. The first is the shavings system, which removes the sawdust and shavings from around the machines. Waste cans with hinged covers are almost essential now, removing one very common source of trouble. A few refuse cans of sheet iron, placed conveniently, will dispose of one item that has always been a source of danger, and that is the throwing of old papers and clothing in out-of-the-way corners or under benches. The providing of boxes to hold scrap, preventing its spreading out over the floor, would also help prevent fire gaining a foothold.

Of those precautions directly concerned with fire prevention, the one most highly specialized is the sprinkler system, which has been brought a high degree of efficiency. While the modern system does not require much attention if properly installed, still, in cold climates in particular, a little carelessness will put the whole system out of commission. In some instances entire factories have burned down in spite of the sprinkler system. Properly speaking, its field of usefulness is restricted to checking the spread of fire once started, and the putting out of small blazes before they can spread.

It is well to take the additional precaution of providing fire barrels, filled with a brine strong enough to prevent freezing in the winter, and covered with wooden lids to check evaporation; fire buckets should be provided for each barrel. By using either a round bottom bucket, or one with a handle fastened to the bottom, and fastening them to the lid of the barrel with leather straps well nailed, they will be secure against theft or use for other purposes. When the occasion does arise, a man can jerk them loose or cut the strap in a second's time. The bucket with the handle on the bottom is preferred by many because, while it incidentally serves the same purpose as the round bottom, it is also possible to throw a bucket of water farther and with greater certainty by having a secure hold on the bottom of the pail.

In buildings of any size standpipes should be provided running through all the different floors, connected with the city mains, with a private supply, or with both, is possible. On each floor have a hose line of ample length all ready, connected with the pipe and with the nozzle attached to the other end. This hose is best stored in a swivel rack rung on the standpipe, as this will enable a man to seize the nozzle and run, there being no danger of the hose snarling or kinking. Thus arranged, it is but a matter of seconds to throw a good-sized stream, and with most factories the first few seconds tell the tale. In offices, show rooms and other such places, where fire lines or sprinkler systems would be unsightly, chemical fire extinguishers should be provided.

These can be inclosed in sightly cabinets if desired, but should always be arranged so as to be instantly accessible.

The rational extension of the three lines of endeavor mentioned as follows will do much to lessen the present fire loss, as well as pay fair dividends in the way of smaller insurance premiums: The construction of factories with a view to retarding the spread of a fire once started; the provision for collecting and preventing the accumulation of inflammatory waste and refuse, and the adequate provision of apparatus and water for the prompt extinguishment of small blazes.

GROWTH AND DISEASES OF TIMBER.

True "timber" is yielded only by those trees which increase their woody structures by periodic additions outside the layers already formed. Such trees are known as "exogen," in contradistinction to that group of trees which add their annual growth inside the layers already formed, and which are termed "endogen."

One of the necessary conditions to good timber is that the annual layers, or rings, shall be evenly grown, and of the right average breadth; another, that the central parts shall be sound. In old trees these central parts are apt to decay.

The stem of a timber tree consists of: the inner and perfected layers, termed "heartwood," or "duramen," and the outer, younger and imperfect layers, known as "sapwood," or "alburnum," and the exterior of the whole stem, commonly known as the "bark." The center part of all of the stem, viz., the pith, is composed of a cellular tissue, the cells being numerous, and of varying size. This pith, which in a young tree is full of fluid, does not, as might be supposed, increase in bulk as the tree matures, but appears rather to diminish, by reason of the fluid drying out; but it retains its place, however, in the oldest trees.

There exist in the transverse section of the stem of a timber tree radiating lines from the center of the bark, called the "medullary rays," and known to the carpenter as the "silver grain." These lines are usually very fine; but in some cases, as for instance in those of the oak and the beech, they are of two kinds, the one broad, and the other quite narrow. Much warping of timber (especially when it is unseasoned) could be avoided if, in its conversion, some regard were paid to the arrangement of these rays. The timber should be cut as far as possible in their direction, as the shrinkage in seasoning is, for the most part, angular to them, says J. S. Holliday in a lecture before the Institute of Builders.

By the construction of these medullary rays, in connection with the annual rings, a means is afforded for the ascent of the water containing mineral salts and gases obtained from the soil by means of the roots. This water or sap rises each spring, and continues to flow through the tubes until it reaches the leaves (which have been termed the laboratory of the plant), where it is distributed to the leaf-cells, and gives up its minerals. These leaf-cells, thus supplied with salts, etc., and exposed to the sunlight, manufacture organic compounds (which, by chemical change, become wood substance), which compounds are carried from the leaves back into the stem, and pass by the inner tissues and medullary rays to the growing part of the tree.

The "cambium," a delicate layer of active cells on the outside of the sapwood, being supplied with food materials, adds new layers of wood to that already formed and the stem is enlarged periodically. The woody layers, when first formed, are full of sap but change and gradually become solidified by the drying of the wood cell walls of each subsequent layer. The perfecting of the layers is very gradual, and the time necessary to convert sapwood into heartwood varies considerably in different trees; but I believe the oak forms its wood most rapidly, under ordinary conditions, and the reverse usually in the case of pines and firs.

Most timber is subject to certain defects, such as rind gall, fissures, etc., and in proportion to the scarcity or abundance of these defects may be said to depend, to a large extent, whether

the timber will be good or bad. Of fissures, we may mention three: the "heart shake," the "star shake," and the "cup shake," which are most commonly met with.

Heart shakes run in the direction of the medullary rays, the wider part being next the pith, and if they occur to any extent, the conversion of the timber into planks is seriously interfered with. I believe that the principal cause of the heart shake is the unequal loss of water, and the consequent shrinkage of the older part of the wood. The star shake is another form of radial fissure, which, however, unlike the heart shake, widens toward the bark. It is thought that the star shake is due to the more rapid drying of the outer layers of wood as the tree lies exposed after felling. The cup shake, unlike either the heart or star shake, occurs in the plane of the annual rings, and more or less entirely separates the layers. This kind of shake may be due either to sudden changes of temperature, the excessive bending of the tree, or to other and unknown causes.

But the woodworker is more interested in those diseases which attack converted timber, and of these the most important is dry rot. The spore, or fungi, germinate on damp wood, provided some alkali is present—such, for instance, as ammonia fumes in stables—then, under the influence of warm, still air, i.e., absence of ventilation, its spawn threads spread, not only in all directions through the wood, forming grayish-white cords and flat cake mosses of felt on its surface, but even over damp surfaces of brickwork or soil, and thus to previously unaffected timber. The fungus destroys the surface of the timber, lessening its weight, causing it to warp and crack, until at length it crumbles up, when dry, into a fine powder, or, absorbing any moisture, becomes a soft, cheese-like mass.

Imperfectly seasoned timber is most susceptible to dry rot; the fungus can be spread by its spawn, and we are told that this can be carried by the clothes, or even by means of the workmen's saws, to other wood that is sound, if the diseased timber is left near it. On the other hand, dry timber, kept dry, is proof against dry rot, and exposure to really dry air is fatal to this fungus.

It is generally thought that natural or air seasoning gives the best results, for which purpose the wood is piled in a seasoning yard, protected, so far as possible, from sun and rain, but with air circulating freely on all sides of each log. Bad ventilating is sure to cause dry rot; stacking timber vertically or at an angle is inclined to produce unequal drying; the planks should be stacked flat or on edge.

It may be interesting to know a method of patent artificial seasoning which is as follows: A stoving building is erected, about 26 feet by 8 feet (inside measurements), built in brick and lined with cement, with flat fire roof of concrete, and a pair of teak doors closely fitted at one end. Three openings 12 feet in diameter form ventilators in the roof, in which there are also two small holes for lowering a registering thermometer through. Trolley lines are laid on the floor so that the timber can be loaded onto the trolleys outside and run into the store. Under the floor a chamber is formed with an arrangement for superheated steam, which is conducted from an adjacent boiler through a system of pipes to discharge pipes, which distribute the steam evenly in the main chamber.

The timber is carefully stacked on the trolley, allowing space all around same; the trolley is then drawn into the chamber, the doors are secured, and the ventilators closed. Steam is then admitted for a certain number of hours, and subsequently superheated steam for a further number of hours. During the whole process the temperature must be constantly tested, and regulated to conform to a tabulated list, which, however, varies according to the thickness, kind, and initial state of the timber, and the atmospheric conditions prevailing, all of which factors have to be taken into consideration.

The required temperature (which it may be necessary to raise to 225 degrees Fahr.) must be arrived at gradually, and sudden changes carefully avoided. The temperature can be regulated in various ways, either by slightly reducing or increasing the

amount of steam admitted, by cocks on the superheater, or by slightly opening for short periods one or more of the ventilators. With care the desired temperatures at the required periods can be obtained within three or four degrees. The time of steaming varies between 20 and 36 hours, during the whole of which supervision is necessary.

When the processes of steaming and superheated steaming are completed, the supply of steam is shut off, the ventilators are fully opened, and the fire under the superheater allowed to die out, so that the temperature in the chamber may gradually cool. Volumes of vapor are at first emitted, but these rapidly diminish, and cease altogether within about 24 hours after steam has been shut off. The temperature is then tested, and if it is within about 15 degrees of normal, the doors are slightly opened, to assist in ventilating the chamber. The doors, however, are not fully opened before 36 hours after steaming, or until the temperature inside the chamber is within 5 or ten degrees of that outside.

The timber is then removed into sheds, and providing the treatment throughout has been properly carried out, within about 14 days' time the timber is equivalent to seasoned wood. Timber is not diminished in bulk or decreased in strength by this process; in fact, particulars of tests carried out by me go to show that, if anything, the strength of timber is increased by the process.

The theory of the process is that moisture in the timber is expelled by its conversion into a more fluid state by opening the pores and ducts of the fibers, and allowing steam, and then superheated steam, to permeate the material, and the heat in the chamber and the timber will assist in expelling the moisture, etc., after the steam is shut off.

ILLUSTRATIONS OF THE MONTH.

(Illustrated on Page 33.)

The Berline and Limousine bodies on Stevens-Duryea chasses, (Stevens-Duryea Co., Chicopee Falls, Mass.) are charming examples of the body-building art. The workmanship and finish of the actual carriages are quite up to the very handsome illustrations. It hardly needs any word of us to characterize the engineering part of the vehicles, as the Stevens-Duryea principles of construction, as well as the thoroughness of the manipulation are known to all men who pretend to know at all. When we use such terms as unit power plant, three-point suspension, and even multiple disk clutch we hark back to the bright thinkers in that organization who build with the head as well as with hands.

The pathfinding for the approaching Glidden Tour was done in a stock Stevens-Duryea Six, that has made a notable record for both time and endurance under stress of bad road conditions.

(Illustrated on Page 34.)

A combination tourist, sleeping, observation and dining motor car has been constructed by Dr. and Mrs. H. C. Newton, of Chicago. They contemplate a 3,000-mile outdoor trip with this vehicle, living day and night in the open and securing the enjoyment passed up by the motorist who hurries to reach the next town at night so he can stop at a hotel. The automobile used by Dr. and Mrs. Newton is a four-cylinder, eighteen horsepower, four passenger Franklin touring car, made by the Franklin Automobile Company, Syracuse, N. Y. When it is on the road it will present an appearance differing little from any ordinary tourist's car.

The really striking part of the whole affair is its appearance when transformed for sleeping. "In planning this outdoor life," said Mr. Newton, "we thought, why carry a tent when the auto top is a good tent and why carry cots and springs when with very little effort the touring body with its upholstery and springs could be converted into berths."

Accordingly he sawed vertically through the back of the front seat near the sides, and where the back joins the seat placed hinges, permitting the back to fall and bridge the open section of

the tonneau between the forward and rear seats. In front of the forward seat a raised section of light wood completes the berth arrangement. Over this whole surface, when let down for sleeping, is placed a pneumatic mattress forming a bed, surpassing in comfort many which the tourists would find if they stopped at hotels.

At the beginning of the day when the tourists awake there is ample room in the improvised sleeping car to dress. The next move consists in rolling up the bed clothes and stowing them away, while the pneumatic mattress will occupy a very small space when deflated. The side curtains are rolled up, the board at the front of the car is removed, the front seat back snaps up into place and, with the curtains pulled off, the vehicle is again an ordinary car.

During the night the fireless cooker has prepared part of the morning meal; the one-burner stove does the rest. After breakfast the tourists will start, if they do not choose to tarry in some pleasant wooded spot, and traveling will be leisurely.

The second example is a Franklin Model L-5 one-ton truck with air tires. This air-cooled, 18 horsepower truck is one of the practical kind owing to the ability to use larger wheels, and of course, larger tires, because the Franklin air-cooled practice and wood sills (or chassis) does diminish weight most effectively. The result is flexibility, cargo-carrying capacity and low up-keep expense. The example shown looks business-like—and is.

(Illustrated on Page 35.)

Buffalo Bill's Wild West Show Car, built by the Martin Carriage Works, of York Pa., is a new evolution, and most interesting. This body was mounted on a 4,000 pounds capacity truck. The electrical feature and display is generated by a 30 H.P. engine connected with a dynamo for the purpose. As you no doubt know it is an advertising car, and the electrical effect is very realistic showing very fully the blood red nostrils and with the winking and blinking of the eyes, as well as the flashing of the lights revealing the face of Col. Cody, and the words Pawnee Bill. The same effect is shown on both sides of the car. When this car was finished, it was taken over the road from York to Baltimore, where it was willingly and gladly accepted by the representative of the Buffalo Bill Advertising Agency. It is owned and operated by the International Movable Electrical Display Co.

NEW PRESIDENT INTERVIEWED.

Jason Schneider, president of the Cincinnati Carriage Makers' Club, states that the buggy industry of Cincinnati has held its own, despite the vast development of the automobile business. "There are about as many men employed," he said, "in the buggy factories of Cincinnati to-day as there were ten years ago, before the advent of the automobile, and the number of buggies made annually in Cincinnati now is about as large as it was then. If there has been any reduction it is very slight. There were fears that the automobile would make devastating inroads on the buggy business, but these fears have proven unfounded. There have been a number of instances in which buggy manufacturers branched out into automobile manufacturing, but, not finding that a bonanza, they returned to the buggy business."

GOOD BUSINESS.

March showed the largest sales in the history of the Columbus (Ohio) Buggy Company for any one month. The new orders are well distributed over the country, and especially are they good from the Southwest and the Pacific coast.

LARGE ORDERS.

The Hoover Wagon Works, York, Pa., are busy on large orders for horse-drawn vehicles for the spring and summer trade. The company has a large contract for a number of United States regulation screen mail wagons.

Carriage and Automobile Painting

BLOCK LETTERS, INCLUDING EGYPTIAN.

Useful alphabets for the wagon letterer are the Block letters, which are a direct growth from the Egyptian. They can be made higher or lower than their width, or be made square. They can also be extended to almost any length, and, if properly executed, will look well on a panel. There are a number of variations and dif-

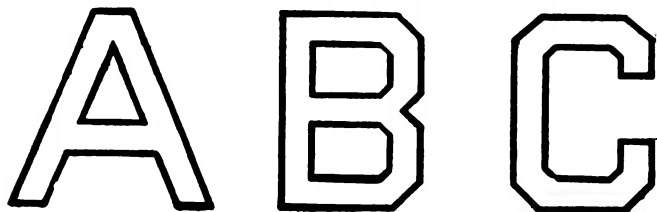


Fig. 2—Boston Octagon Egyptian.

ferent names for the resulting styles, including the Boston Round Egyptian, Fig. 1; Boston Octagon Egyptian, Fig. 4; New York Octagon Full Block, Fig. 5, and Round Full Block, Fig. 6. The above comprise about all the standard block letters used by sign writers and wagon painters; but with these you can, for

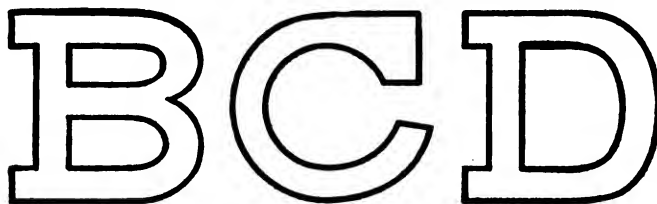


Fig. 3—Boston Round Full Block.

business wagon lettering, make any number of different styles.

The principal feature of these letters is their solidity—all their parts being of equal thickness. They are showy, and look larger than other styles of letters occupying the same space. The width of the Egyptian is three-fourths of its height, except A, K, M, V,

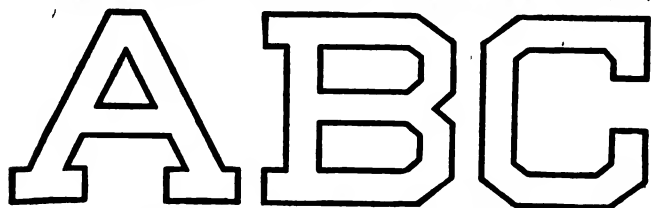
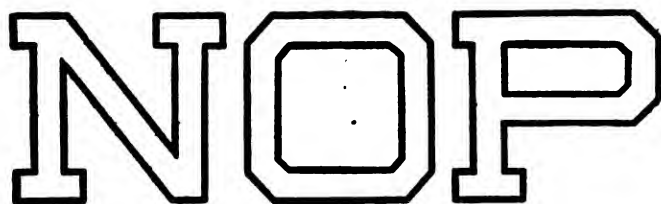


Fig. 4—Boston Octagon Full Block.

W and &, which require to be a little wider. The thickness is the usual two-ninths of its height. The letter is so simple in construction that close attention to the copy is all that is required to get a good idea of the Egyptian alphabet.

There are two styles of the Egyptian Block, the Octagon and

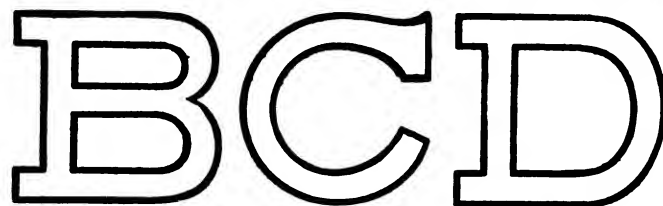


No. 5—New York Octagon Full Block.

the Round. The Octagon is composed entirely of straight lines, giving the letter an octagonal shape, from which it derives its name. The Round is partly composed of curves, and is, therefore, more difficult to manage. The labor of making the Round Egyptian is considerably lessened by first sketching out the letter slightly in Octagon, and drawing the curved lines afterward,

since both the Octagon and the Round are of the same size and space. The B, C, D, G, J, O, P, Q, R, S, U and & are the only letters in the Round which vary at all from the Octagon, and the others being precisely identical.

The diagram marked Fig. 7 shows the simplicity of the typical



No. 6—Round Full Block.

Egyptian letter. The lines A, B, C, D represent the top and bottom lines, or height of the letter. The lines E, F, G, H, are drawn parallel to these lines, and at a distance from them equal to the thickness of the letter. Then, after drawing the perpendicular lines, making the letter of a proper width, almost any

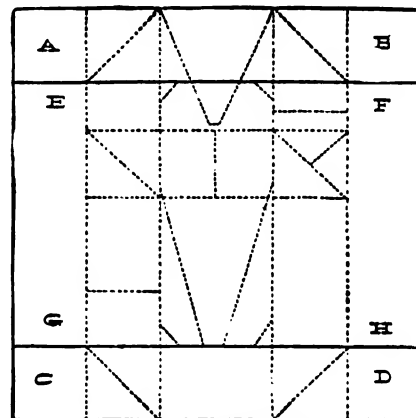


Fig. 7—Diagram.

Egyptian letter can be made in this one space. Thus, in the dotted lines will be found the letters B, C, D, E, F, H, I, J, K, L, M, N, O, P, S, U, as well as the numerals 1, 3, 5, 8, 0.

PANEL ORNAMENTS.

The painter is on the alert for good ornaments that are not usual or common. Medallions for panels, rounded corners, etc., have their attractiveness. The mural decorator has been responsible for many of the best suggestions of this nature, and these we show from The Decorator seem to us to be effective. The wagon painter can modify them, if he deems it necessary for his purpose. With a suggestion it is easy to add or take away lines or ornamentation so that the design is adapted to the purpose in mind.

The greater expanse of the auto body work designed for commercial uses will change the established methods of treatment some, and may call for more ornamentation. At least the painter will have a chance to test his fancy in combinations of color and ornament out of the beaten path.

MISTAKE TO DO IT.

A very great mistake a number of manufacturers of automobiles and other steel using firms make is using the one or nearly the one grade of steel for all kinds of work. But, after a time, they come out of the old rut, when it has cost them a few thousand dollars.

MOTOR BODY DECORATION.

The body of the car is having focussed upon it much greater attention than in the beginning of things motor-wise. Some of the suggestions are good, some quite new, and others nice, but of a kind to induce suicidal mania among coach painters. We like to present the subject from all angles, so the ideas of a writer in *The Motor*, in England, are here given:

The exterior decoration of a horse-drawn carriage had become so much a matter of convention or tradition in the manner of arranging the color scheme upon the whole vehicle, following the form of the carriage in the arrangement of the various colors, that any apparent departure from the generally-accepted practice came to be regarded as altogether unorthodox. It was and still is the practice to paint certain parts of a carriage black and certain parts in colors, the underpart and wheel being of a different color to the upper portion. Attempts have been made from time to time to vary this treatment, but seldom with success, and in no instance has any permanent alteration been effected. The upper part of all coaches was at their first introduction covered with leather, and this was not brilliantly polished as now, but dull, and the surface left to the industry of the coachman to attain any polish upon it. Except in the case of state coaches, where colored and embossed leather was used, the landaus and other carriages which could be used either open or closed kept their black leather hoods. While the Berlins, coaches and, at a later period, the broughams, had the upper parts fixed and paneled, these followed the general outline and had the upper parts painted black similar in appearance to the older leather-covered carriages. The under framing and wheels of the older carriages were never finished with the same degree of care which the upper part or body received, not being varnished at all; the state carriages depending upon elaborate carvings and heavy gilding for their decoration.

The modification of the form of the under framing led to alterations of treatment until this part was as carefully finished as the body; often, indeed, the latter was the most plainly decorated.

The totally different appearance of any motor carriage to the old horse-drawn vehicle might be considered sufficient to justify a completely different treatment as regards the color decoration, especially when the difference of the under part of one type of vehicle is compared with that of the other.

Having placed the spare tire in a position in which it does not interfere with the outline of the side elevation, and the boxes for accumulators, tools, etc., being so disposed that they are subordinated to the outline, the side may be treated as an artistic composition and the component parts considered in the color scheme. The grey or red color of the tires may be slightly modified. The metal work, usually left bright brass or nickel, may be bronzed or painted and in this way subdued in tone, leaving only the leather work of an open carriage to consider. The efforts of the leather jannner are entirely directed to the obtaining of a brilliant jet black, and all those hides which show a brownish tinge are rejected for the best class of work. Would it not be possible, by an alteration in the character of the ingredients of the japan enamel with which the hides are covered, to obtain a modification of the jet black? A shade of brown might be obtained as translucent as the black, which would harmonize with many shades of brown color or lake. Sometimes a material which is not leather is used where a dull surface is obtained, but this does not always appear to be the most suitable material to use. From the utilitarian and aesthetic point of view, a dull grained, properly-prepared harness leather which could be regularly polished with the ordinary harness preparations would give variety to the appearance without the brilliance of jet black enamel leather. Where leather has been painted in special colors, such as white, silver grey and aluminum color, there has been an opaqueness of appearance, which has detracted from the highly-finished surface. An example of leather enamelled in aluminum was exhibited at the last Olympia show, and gave to the finished work in the

car an appearance as brilliant as it was novel. The question of wear and appearance after use could only be decided by the test of experience.

For open cars fitted with the Cape hood the choice of a suitable folding and covering material is rather limited and the majority of the various fabrics which are offered for this purpose are either light brown, drab, or dark blue, brown, or black in color, and none of them has the brilliancy of the patent enamelled leather. Generally, however, it will be found that the lighter shades are in harmony with the light colors and the darker shades with the dark colors on the body work immediately beneath them. Care, however, has to be exercised in selecting materials and colors, for by very slight differences in shade **unlooked-for results may** be achieved and not always the most agreeable.

The motorist who selects a material for the purpose of covering his Cape hood may quite conceivably be **superimposing a color** which will kill a delicate shade or tint previously selected for the painting of the body work. Some instances of this have been met with; done by those who laid claim to some artistic knowledge.

The pitfalls in the way of the motorist in search of novel and artistic effects in the decoration of his new car are very numerous, and some of the more obvious ones have been referred to. The modifications of color possible in those parts which are essential to the motor carriage, as the wheels and the hood, are not many, and the full effect of any departure from the normal can only be gauged when the decorative scheme is considered as a whole, embracing not only the panels and large plain surfaces, but those parts which are subordinate and subdivided into smaller spaces. Here is the real opportunity for the artist to attempt the achievement of some measure of success. There is no golden rule or royal road which will render smooth the path before him, for there is no limitation to the variety of form in the car, and the position of a wheel with its circle of white, or the curve or length of a mudguard with the light flashing upon it, and reflected in the panels, may mar with its obtrusive shape an otherwise excellent scheme.

HERALDIC PAINTING.

There are sometimes crests and other insignia to be transferred to panels, and it falls to the painters' share of the work in the shop.

This herald painting is one of the arts of the business, and its practitioners are not many. A few observations on the educational equipment required for a skilled performance are given in Cooper's *Vehicle Journal*, and we are pleased to repeat them.

It is an utter impossibility for anyone to imagine they can do herald painting if they are not thoroughly master of freehand drawing. To imagine you will always have a copy the exact size to trace from, will only run you into a deal of trouble and annoyance. Take, for instance, the case where a customer buys a carriage, or has one thoroughly done up, in all probability the only copy for his crest you will receive will be an impression from his seal, not a quarter the size required to be put on to the carriage, you will therefore require to draw it, enlarged to likely four times the size; again, probably you will be handed some engraving requiring certain parts left out, and others added to it—through death, or marriage, so you will easily see how necessary it is to be quite prepared to make a sketch to suit your customer.

I go further and say it is very much easier for the painter who has thoroughly mastered model drawing and shading from the cast to excel in this class of work, than for the man who has never, especially in his youthful days, practiced the art of drawing besides, to be able to make a correct copy of anything, is training the hand and eye to become master of the delicate work so often required to be placed in the crests, shields, etc., so often painted on the coach panels, besides it saves a deal of labor as the work proceeds. Whenever a man is doubtful as to the cor-

rectness of his drawing, and keeps going on in doubt, very soon shape and size get disproportionate, leading to many alterations, until the whole drawing becomes more and more unlike the copy, which must of necessity be re-drawn, otherwise approximation takes the place of accuracy, which if painted upon can never be remedied afterwards. The drawing must from the very first be correct if a piece of good work is to follow, hence the importance of correct drawing.

WHAT IS LAC?

Lac is a resinous incrustation excreted by a scale insect. The mouth parts of this insect consist of a "beak" or sucking apparatus combined with a pointed lancet. With this latter the scale pierces the bark of the twig of the tree and then inserts the sucking tube and draws up sap. After modification and absorption of some of its products, the sap is given out as an excretion at the anal end of the body. This excretion solidifies on contact with the air, and thus there is gradually formed round the body a scale. This scale is popularly known as lac. Were only a single insect present on a branch, the scale would appear as a circular dome-shaped reddish excrescence on the surface of the bark. Owing, however, to the production by the female of a very large number of eggs and the habit of the insects, which indeed is common to many of the family, of living and feeding gregariously, closely packed together on one twig, the scales or cells coalesce during their formation, and result in the production of a continuous incrustation on the twigs, which, on collection, forms the article of commerce known as stick lac. From this stick lac the product known as "shellac" is manufactured.

The lac industry is among the most ancient of the minor industries of India. The trees upon which the insect lives are the Kusum and the Palas trees, the latter of which is known in Sanskrit literature by the name of lac tree. The industry would seem to have an antiquity of several thousand years in the country.

That the lac resin was used as a varnish some centuries ago is evidenced by the fact that in the Ain-i-Akbari issued in 1590, a note is given on the subject of the proportions of the resin to be employed in the varnishes used for the wood work of public buildings.

One of the earliest European writers on the subject of lac was a Dutchman. His explorations were published in 1596. He gives full particulars as to the uses of the resin, but was ignorant as to the agency by which the substance was formed.

The cultivation and collection of lac was, and practically still is, chiefly in the hands of the aboriginal races of the poorer parts of the country, and the methods of propagation and collection still in force are those which were in existence centuries ago. These methods satisfied the demand for the article in the country and, until quite recently, that of the export trade. This latter has developed but slowly. It took nearly half a century for the properties of the resin to be fully appreciated in Europe.

NEW PAINT OILS.

Those following developments in paint technology will have observed that authorities are using and recommending oils and ingredients of paints not hitherto regarded as standard materials. Such oil as China wood oil, soya bean oil, menhaden oil, maize oil, etc., cannot be recommended to painters as suitable raw materials for them to use. It is, in point of fact, a very debatable question whether raw linseed oil itself is a suitable raw material for painters to use under the present condition of the linseed oil trade and market, but however that may be there can be no question at all that the newer paint oils referred to cannot be satisfactorily used in their native condition by painters.

It must not be imagined, however, that because this is so these oils are unsatisfactory ingredients of paints. Quite the reverse is the case, but if required they must be specially prepared and used with knowledge and discretion.

A great number of people appear to think that it is a term of reproach to say that a certain varnish or enamel or mixed paint contains China wood oil. This is absurd, China wood oil being one of the most valuable assistants which the progressive paint manufacturers now possess, and it would be as sensible to deny him the right to employ this material as it would be to taboo the use of manganese or litharge or kauri gum.

NATIONAL ASSOCIATION OF MANUFACTURERS

The sixteenth annual convention of the National Association of Manufacturers, John Kirby, Jr., president, will be held at the Waldorf-Astoria Hotel, New York, May 15-17. In issuing the call for the convention President Kirby says:

"There has never been a period when the country's industrial interests have been confronted with so many vital problems as in 1911. Never before has organization been so needed and discussion been so important to the welfare of the nation's industries. The sixteenth convention comes at a time when every manufacturer finds himself face to face with conditions strongly affecting the future safe conduct of his business. The problems which will claim attention include labor in its various ramifications, also the great constructive policy interwoven in the prevention of accidents and the equitable solution of the urgent question of industrial relief."

Results of the investigations made in Europe, covering the important subjects of accident prevention and industrial relief, will be presented in the form of a report.

Addresses will be made by men prominently identified with the problem, and discussions will be held. An important feature connected with accident prevention and industrial insurance will be the displaying of a great number of lantern slides, illustrating not only the experiences of Germany, but also conditions in the United States. The fact that fully one million persons are injured yearly in the industries, and that under our present laws it required an expenditure of more than seventeen million dollars to administer nine million dollars for the benefit of injured employes in 1909, indicates the vital importance of the subject to labor, capital and the general public alike.

A special feature will also be made of banking and currency, and the attitude of our manufacturers toward the plans recently proposed to reform our inadequate banking and currency systems will be discussed. Other questions, such as immigration, industrial education, a reform of our patent laws and the creation of an independent tariff commission of experts will also be considered.

The sessions will be open to the general public and the association extends a cordial invitation to all manufacturers to attend, whether members of the association or not.

BIG MERGER.

Officers of the newly organized American Implement Company, with authorized capital stock of \$50,000,000, say no stock will be issued immediately other than an amount similar to that of Deere & Co. and others making up the new merger. There are also included all the old Deere subsidiaries, including Deere & Mansur, the Moline Wagon Company, the Velie Motor Vehicle Company, the Velie Carriage Company, all of Moline, Ill.; the Kemp & Burpee Company of Syracuse, N. Y., and the Deere selling agencies in ten states. William K. Butterworth is president of the new concern.

VEHICLE FAIR.

The fate of the National Implement and Vehicle Fair, Peoria, Ill., now rests with General Chairman E. F. Baldwin, to whom was transferred all of the stock subscription lists and to whom has also been assigned the task of completing the required \$50,000 capitalization.

TWO VERY POPULAR MEN.

The announcement that L. E. Hicock was once again a resident of Mechanicsburg, and a factor of the D. Wilcox Mfg. Co., was received with gratified surprise by his many friends. Mr.



L. E. Hicock.

Hicock is one of the men in the carriage trade who not only do things, but leaves a lasting impression in the doing. He had a departure send-off by his late associates in the Cleveland Hardware Co. that should have filled him with deep gratification. It was an event of honor. We don't have to wish him success in



F. E. Wilcox.

his new venture, as the writers would put it, because he was always successful in it, and of course will continue.

Mr. F. E. Wilcox has done a great work in his job. His sagacity, fine business poise, and hearty manner have made him as

many personal friends, as the goods he makes have always been friend makers for the Wilcox concern.

THE APPROACHING CARRIAGE CONVENTION.

We have received from Secretary McLearn the following announcements that renew attention to the convention of the Carriage Builders' National Association:

To the Members of the Carriage Builders' National Association.

Dear Sirs:—The thirty-ninth annual convention of the Carriage Builders' National Association will be held in Atlantic City, N. J., during the week commencing September 24, 1911. The exhibition from September 25 to 29 inclusive; the convention, September 26, 27 and 28.

We have fine accommodations for both the convention and the exhibition on the Million Dollar Pier, so these important affairs will be in the same locality. As September is one of, if not the most delightful month in the year at the seaside, and as we expect a very large exhibition and a full attendance, and the meetings and the banquet will be of great interest to all, we hope you will arrange to be present and spend an enjoyable week with your fellow members and tradesmen.

By order of the Executive Committee.

HENRY C. McLEAR, Secretary.

Instruction To Be Obtained From The Exhibition of The Association.

The value of the exhibitions of accessory parts given at the annual convention of the Carriage Builders' National Association, is inestimable to those who attend. In no other way is it practicable for the carriage builders to see all the latest improvements in vehicle parts. They cannot devote the time to visiting all the factories producing those parts, neither could they well afford the expense. No carriage builder can hope to measure successfully with his competitors to-day, unless his vehicles are equipped with the latest improved parts and constructed so as to embody such qualities as durability, symmetrical lines, elegance of finish, etc., all of which are more nearly possible to produce by the manufacturer who is entirely familiar with the latest innovations in vehicle construction.

A visit to these exhibits by the superintendents, assistant superintendents and foremen of the various departments of any carriage factory is certainly time and money well invested. An annual exhibit of the finished parts or the product as a complete article, is now not only customary but essential to all producing industries.

The farmer and fruit grower find it necessary to have yearly exhibits of their products in order that competition may be met and the highest degree of efficiency achieved. Every reasonable encouragement should be given the manufacturers of vehicle parts who incur much expense to make these exhibitions interesting and profitable to the carriage manufacturers.

CHARLES C. HULL, Connersville, Ind.

IN FIGURES.

Consolidated Rubber Tire Company reports for the year ended December 31 last:

	1910.	Gain.
Gross sales	\$2,160,915	\$1,027,702
Total income	2,311,317..	1,107,454
Net earnings	85,515	28,505

HE SAYS MOTOR TRUCK IS ON TOP.

P. D. Wagner, president of the General Vehicle Company, who has recently made a trip to big business centers, says: "Investigations among the leading commercial houses throughout the country show in the most convincing manner that hard headed business men are appreciating the advantage of the power propelled truck over the time-honored horse-drawn vehicle."

Benefits of Organization

Address by O. B. Bannister before Cincinnati Carriage Makers' Club.

There was a time in the history of man when the individual family was a complete organization—an organization of government, commerce and labor.

Father's and mother's word was law—government. Father and sons took from the forests the logs with which to build the home; tilled the soil, cared for the crops and stock; mother and daughters spun the flax or wool and made the clothing, as well as to provide food to feed all of the family. This was commerce. Fathers and sons, mothers and daughters were a united labor organization that had only thoughts of love for each other, and of how they could do that which they had to do for the benefit of all.

There was neither strikes, lockouts, trusts, combinations in restraint of trade, labor organizations, fighting for closed shops; and indeed, such things could not exist in such an organization, as each part of it honored and respected the other part, and recognized that all was one, and one was all; that the success of one was the success of the other, and that the failure of one was the failure of all.

We read that God, after creating the heavens and earth, started the organization of the human family by creating man and giving him a woman to be a companion and helpmate.

We also read that God blessed them and said unto them, "Be fruitful and multiply and replenish the earth; subdue it; have dominion over the fish of the sea, the fowls of the air and over every living thing that moveth on the earth. Behold! I have given you every herb-yielding seed and every tree and every beast and every fowl, and everything that creepeth, and it shall be meat for you."

Please fix this one point firmly in your mind, as it is the very foundation of my argument.

The Creator did not say to man, "Behold! I will sell you the trees for so much per thousand feed. Behold! I will charge you so much per ton for coal, iron, copper, silver or gold; and so much per pound for wheat and corn, cotton and wool." But He said: "Behold! I have given you all of these things and they shall be meat for you."

From this little beginning, this divinely established organization has gone on and on until the present day. Now its influence extends around the globe; its fruits are known in every land; its membership peoples the earth and controls it. And I fear some few have come to think that they own it.

Do you know that there is in all human kind an innate nature to get together and subdue, create and control things? It was handed to man by God in the Garden of Eden and man was commanded by Him to use it, to people the earth, to subdue, control and have dominion over everything on the earth and in the earth—and from that beginning until the present day history has been one continual and continuous record of organization upon organization, the object of which has been, in most instances, to benefit either individual interests or the interests of the people as a whole.

The growth of this stupendous organization, the human family, has been so rapid and so great that the individual family could not remain the perfect organization of government—commerce and labor—that it was in the beginning, and it has become necessary for the home builders and clothing makers to build homes and make clothing not only for themselves, but for others. The tillers of the soil must not only cultivate for themselves, but for all others that need bread.

Father's and mother's word is no longer law or government—and with this evolution there seems to have come into the mind of man a new and selfish thought. The home builders and the clothing makers have divided against themselves. Instead of the

home builders recognizing that all home builders are a part of their family, and the clothing makers, instead of recognizing that all clothing makers were a part of their family, they have divided themselves into groups, and like the children of Israel of old, have selected for themselves captains to rule over them, whose chief duties seem to be to try and direct them in a way to destroy some other group of the same family, so that to-day we have government against government, brother against brother, sister against sister, in the selfish strife for supremacy. A wholly unnecessary condition, as it seems to me.

I do not mean to say that these modern days are wholly responsible for this condition.

Early in history the principle of organization, as given by God, for all to work together for the good of all, with that which he had given them, was departed from and the principle of organization for selfish purposes and private gain was substituted.

It is quite well established, I think, that the only reason why the Jewish people are forbidden by their laws to eat hog meat is that when Moses was on Mount Sinai receiving the law of God, that Aaron, his brother, bought up all the hogs; and when he refused to share the profits with Moses, Moses, the lawmaker, promulgated a law forbidding the children of Israel to eat hog, and busted the trust; and strange as it may seem, from that time on many of the business and commercial interests of the world have been busy forming trusts, and the lawmakers just as busy trying to bust them; and the end is not yet.

But there is a way in which they could be handled that would tell whether they ought to be busted or whether they ought to be encouraged.

I notice that my friend Overman said to you in your December meeting, "That competition was one of the most valuable assets possessed by the trade; that it stimulated energy; raises the standard of merit, and was a great force for good."

If he meant a competitive spirit that was striving to see how good and meritorious an article could be made and how well the people engaged in the manufacture of it could be provided for, I would agree with you, but if he meant "price competition" was a great force for good, I would be obliged to disagree with him.

The old saw, "Competition is the life of trade," has been repeated so many times that some people have really tried to believe it. I have. No doubt you have.

Let us see what is this thing "Competition." If it is the trade's life we ought to be able to compare it with the blood of a healthy man—that which flows through his veins, brings color to his cheek; that which makes him step quick; that which makes him stand erect, his eyes to sparkle, and his tongue to say: "I am glad that I am alive." This is life, and life worth living, and, of course, if competition is the life of trade it must be that something that will develop the body (trade) and make it strong, give it life, build it up and make it a means of benefit to everyone engaged in it. And when I use the term "everyone," I do not mean the employer only, the employer and the employees.

My dictionary tells me that competition means common strife for the same object, and it also tells me that strife means altercations, violent contentions, fights, battles.

Suppose we were then to change this old saw to read: Competition, that is, common strife for the same object, altercations, violent contentions, fights, battles, is the life of trade. This, in part, is really what competition means, except that I think we could change one more word, which would show the result. Let us do it and make it read as it really is: Competition, that is, common strife for the same object, altercations, violent contentions, battles, is the death of trade.

Jones is in the manufacture of stockings. He is the owner of a

nice plant; employs men; pays his help well; is making money and satisfied. His laborers are satisfied. They have enough with which to provide their families with clothing and with plenty to eat.

Smith, who lives in the same town, says: "That man Jones has a snap. I guess I will go into the stocking business myself." And he does so.

Now, he must sell his stockings to the same trade that Jones has been selling. He does so by reducing the price that Jones has been making 10 per cent. The buyer of the stockings rubs his hands in glee and says, "Ah! That is good. Competition is the life of trade."

Jones, as I have said, has a good plant; has been buying his wool direct from the farmer; employing men, and paying his help good wages. But the buyer to whom Smith has sold by reducing the price 10 per cent. is never satisfied, so he tells Jones he is buying from Smith at 10 per cent. less than his price.

Then Jones gets busy. He puts upon a piece of paper the cost of the wool. He looks at it and studies it and wonders if the farmer could not afford to furnish it for less. He knows the farmer did not pay the Lord anything for growing the wool on the sheep's back, and there was, therefore, no cost of raw material, and the only thing that made it cost the farmer anything was the cost of the labor in caring for the sheep and in raising the food with which to feed them.

He consults with the farmer, who, by facts and figures, proves to him that he can not continue to pay his labor the price he has been paying and sell the wool for a lower price and making a living for himself and those associated with him.

He now places on this piece of paper the names of all people in his employ; the amount paid them; the cost of his taxes, insurance and fuel, and when he adds them all together he discovers that it is impossible for him to meet the prices that have been made by Smith and leave him a profit. Jones, as I have said, has been employing men in his factory, but upon investigation, he finds that Smith, who is selling stockings for so much less than he can, has employed women and girls, whom he can employ for enough less to reduce the selling price 10 per cent.

So Jones concludes to displace his men and employ girls only, as he can go Smith one better and employ girls from fourteen to twenty years of age for less than Smith can employ both women and girls, and he does so.

The common strife for the same object begins and continues.

First Jones is on top and then Smith. Each reduction must bring additional reduction in the cost, and as the Lord has made no charge for the raw material, there is nothing in the cost of the stockings except the labor that is necessary to put on them to make them. Consequently, there is nothing to reduce but the labor—and the reducing price goes on down, down. The hours of work are increased; the age of the laborers reduced to the very minimum, until mere children are at work, and the burdens are made as heavy as it is possible for them to bear, and the result is, after they have been worked to the last limit, exactly what we have seen in the city of Chicago among the garment makers for the last twenty-two weeks—contentions, altercations, fights, battles, death.

The following paragraph appeared in the Chicago papers Saturday, February 4th.

"The strike has been on for twenty-two weeks, during which time 45,000 men and women have been out, involving 250 firms. It is estimated that the employers have lost \$10,000,000 in trade and the workers more than \$3,500,000 in wages. At least six deaths are directly attributed to the strike. A number of the firms agreed to take back their former employees without discrimination."

Understand, I am not criticising the Chicago manufacturers, much less am I blaming the garment makers for trying to force their employers to pay them enough with which to keep body and soul together.

Employer and employe are both absolutely helpless under the

present system. It is impossible for either employer or employe to help themselves under the present condition.

This is competition.

But let us return to our illustration of Jones and Smith.

Jones and Smith meet one another at dinner some day when the conditions are at the very worst, and one says to the other: "Why in the world do we not get together and agree upon a price for selling our stockings that will enable us to employ men and pay them living wages; get rid of these long hours; this child labor, and make ourselves some profit as well, and be of some service both to ourselves and to our employes."

They so agree, and the result of this is an organization, and it is the kind of organization that was intended for mankind to pursue, and, although it is forbidden by law to-day, their pressing necessities and the distressed condition of their business and their employes make them take the chance.

And if they were only to continue to take the chance in the right way it is my opinion that such organizations should be permitted.

But, after they have formed this organization, and after they have come to know their power, they discover that they control the sale and can compel the buyer to pay whatever they may ask for their stockings, and with the discovery of this new power they seem to forget the conditions of anyone except themselves, and they say to themselves, "This is our business, and we can do with it as we please. It is true we are not paying our help enough—they have but little to eat and barely enough to clothe them—but that is their affair. We control the stocking business and they can't get them from anyone else, and we will keep every dollar we can; will advance the price as much as we can and pile up as great a fortune as we can."

This is a trust. It is also forbidden by law, as it should be.

Organization, as I have defined it in this brief way, should be permitted by law, but trusts should be put out of business. The question then is: How to permit one and prohibit the other?

Before trying to answer this question let us take a little deeper look into our system of commerce as it is.

It is a matter of statistics that there is a great percentage of failures in all branches of trade.

Let us apply the thought.

How many of us know of any large number of men who have retired from business with a competency with which to support themselves and their families in old age?

I am sure you will find if you undertake to place on one list the names of all that you know that have been so successful, and on the other all that you know that have failed, that you will find that the failures, so far as numbers of individuals are concerned, at least, largely exceed those that have made a success.

Should not a system of commerce that brings about this result be changed?

If the 250 firms involved in the Chicago garment makers' fight are a trust, as I have defined a trust, there should be some way of knowing it beyond a question.

If, on the other hand, they are fighting in their way for an existence as much as their employes are fighting for theirs, both against some other group of garment makers in some other part of the country, there should also be a way of knowing it.

What is the cause of all this disturbance? And what is the cause of all these failures?

I say that it is the system. And what is the system? The system is "competition is the life of trade;" and let me say it with emphasis, "trusts." What is the remedy? Let me also emphasize this.

Mr. Bannister's Remedy.

The remedy is legalized organizations that require everyone engaged in any line of trade to associate themselves with all others engaged in the same line, and that requires them to become organized bureaus of information, through which they can show their right to exist, and their right to exist should be based upon their being able to show that they are conducting their

business at a profit to themselves and that they are paying their labor a price at which the laborer can live, and this should be made so clear that it could be understood by producer, by consumer and by the public.

It must be known by the producer because he must know what his goods are costing him in order to enable him to sell them at a profit.

It must be known by the consumer because the consumer must be willing to pay the producer his wages.

And it must be known by the public because the public are the people that invest their money in these institutions, and they must know that their investment is safe.

If you employ a man, you know the wages you are going to pay him. Do you not? And, if you are employed by someone else to make a hat you should be quite as willing that the man who is to pay the bill should know what he is paying. And there is something else that must be shown also.

They must show that they are conducting their business at a profit based upon the cost of their goods, and as the consumer must be willing to pay the producer a profit upon this cost, this profit being his wages, if you please, for his labor, and for the use of his capital, so must the manufacturer pay his laborers a price at which they can live and support their families.

Has it ever occurred to you that there is nothing at all in the cost of any article of merchandise, but labor?

There is fundamentally no such thing as cost of raw material. When the Creator started this organization of the human race He did not say: "I will furnish you the raw material at such and such prices," but He said, "Behold! I place you upon the earth to subdue it, to replenish it, to have dominion over it. I have given you everything upon the earth, the trees, the ore, the coal."

There is not a single item of raw material that is costing mankind one cent. The only cost is labor.

Legalized organizations that are required to show their right to live, and in doing so, to show they are paying cost for their goods, and that this cost permits the producer of it to support their families as families should be supported, will become bureaus of information. They will prevent over-production and the temptation to sell goods for less than cost, and prevent under-production and the temptation to ask more money for them than they are worth.

They will settle the question of the tariff, as they will be made to show positively what effect the labor they can buy in the shape of partially produced goods coming from foreign countries has upon the product of their own labor in their own country.

It will settle the ever-present question between capital and labor, avoid strikes and lockouts and bring harmony where there is now contentions, fights, battles, deaths.

The economic changes that have occurred during the last half century, or during the present generation of living man, have unquestionably been more important and varied than during any other corresponding period of the world's history.

It would seem, indeed, as if the world during all the years of the inception of civilization has been working upon the line of equipment and industrial effort in perfecting tools and machinery, building work shops and devising instrumentalities for the easy intercommunication of persons and thoughts, and the cheap exchange of product and service.

That this equipment having at last been made ready, the work of using it for the first time in our day and generation is fairly begun.

The real facts are that we are just ready to do business in this great country.

It is plainly shown that if the business increases in the United States for the next eight years as it has within the last eighteen years, that the railroad facilities of this country must be doubled in order to handle the business in 1918.

Now, does anyone believe that this great business can be conducted with profit to the capital invested and to the labor that produces it without organization?

And are we to continue our attempts to prevent organization

and give the men engaged in trade the opportunity to form trusts?

It is manifestly impossible for the government to make laws to both control and prevent organizations. The fact that they try to make laws to control the abuse of them is an acknowledgment that they can not prevent them.

This being the case, why should they not be required by law? Is it not clear to you that if they are required, and if they were required to show their right to live as organizations that they could be more effectively controlled than with our present system.

There has been printed in *The Daily Consular Trade Reports*, an article called "The Legal Status of the Trusts in Germany." The author says: I believe that in no country in the world has there been greater developments of trade combinations, understandings of one form or another, than in Germany.

Trade combinations, which have been in existence many years, are extending their influence and new ones are constantly being formed.

A cartel, or trade syndicate, is defined as a combination for the purpose of maintaining the competitive power of its members, notwithstanding their varied individual facilities against the advantages enjoyed by monopolists, by means of:

First—Obtaining a uniform maximum selling price for products.

Second—By the creation and maintenance of a normal and rational demand for materials and labor.

Third—By creating a monopoly for every member or every group of members in each branch of production.

All trade syndicates are organized for one, two or all three of these purposes, and as known in Germany, they may be divided into three general groups or classes, as follows:

First—The selling agreement.

A cartel or convention under which the manufacturers or producers of a certain article or class of production agree not to sell their products below a specified minimum price, agreed upon by all members of the agreement, and changed from time to time in accordance with the varying cost of production and general requirements of the market.

These rather loosely organized combinations were the original type of German trade syndicates and served their purpose very well in prosperous times, but in periods of depression and diminished demand it was found difficult to hold certain members to the agreement, and it was decided to adopt a more binding form of agreement and put the business of selling under direct control of a central authority.

This led to the creation of sales syndicates, in which all members of a cartel pool their products to be sold through the ministrations of a central committee, which, besides fixing the selling price, apportions among the members orders, as they are received, in proportion to the capacity of each, the quality of merchandise ordered, and the condition of transport.

In a syndicate of this class the individual firms and companies which it includes, retain their corporate right to self-government, pay dividends on their own stock, according to earnings, and unless otherwise agreed in the cartel, purchase independently the raw material of manufacture.

The third class includes the real trusts, using the words trusts in the sense in which it was applied when it was originally used, to define closely organized syndicates, which absorbed and took up the shares of the original corporations, issue new stock and consolidate the whole management under the absolute control of a central authority, and not using the word trusts in the sense in which I have used it in my definition of that organization that has come to represent the abuse of a power.

Now, all of these various forms of syndicates are organized under the very comprehensive and far-reaching German laws.

According to this report of the Consul, organizations in Germany are not prohibited, except such as carry on their business in a way which offends against good morals. And what is it that offends against good morals? It is syndicates which, when formed

for the purposes that I have mentioned, depart from those purposes and undertake to control by boycotting; by the cutting of prices with competitors to such an extent to bring about the financial ruin of the latter, and by the misuse of their power.

In one instance:

The Prussian State is a member of a potash syndicate and is a very large miner of potash, and the Prussians undertook the drafting of a new potash law containing the provision that all German potash mines should be compelled to join the syndicate.

While this compulsory measure was not embodied in it as it was passed, the effect is practically the same as if it had been.

It will be seen from this, therefore, that our neighbors across the sea are considerably in advance of us, at least in this thought.

I firmly believe that there is an evolution going on that will result very soon in changing the trend of views of all people engaged in commerce to this thought, and that when organization is given as much thought, and the same kind of thought, as is being given to the subject of conservation and economy, that we will then be prepared to advance all commercial interests in a way that will be peaceful and harmonious.

There is nothing impossible to the human race if they will forget their own selfishness and will obey the command that God gave them when He started their organization.

Let the Aarons and Moses get together and control, subdue and possess the earth and all that there is in it and on it, as He commanded, not for themselves, but for everyone.

There are greater things at work now in this country than the telephone or the flying machine, or any other modern discovery; and it is the thought that is in the minds of the men that are in commercial, trade and labor organizations, and you can no more stop them than you can stop the sun from shining. They are here to stay, and they will be, if not in my day, some day, legalized and become component parts of the great family organization—the human race.

They will be permitted and encouraged, if not required, by law; taught to control themselves for good instead of bad, and when this is the case we will have reached the beginning of a condition that will make mankind love each other instead of hate each other.

The Federal corporation tax law was a step in the right direction. This law cost the manufacturers in the United States for 1909 several millions of dollars—If I remember rightly, something like \$25,000,000—but it was worth all it cost—and do you say why?

First—it required, and will continue to require, all manufacturers to install a system of cost accounting that will give them the facts as to the cost of their goods, a subject about which there was and is so much ignorance that it is amazing.

Second—It has prepared the minds of the manufacturers for publicity, and will make it comparatively easy for them to take the next step in this evolution.

The Tariff Commission, if authorized by Congress, will be another advance. It will be necessary for this body, if appointed, to deal with facts and not opinions, and it will be necessary for them to deal with facts as they may be found, and as they affect an industry as a whole, and not with some individual part of the industry. It will develop that there is a great difference in the effect that a given tariff will have on the firm up-to-date, well equipped and modern in all respects, and upon one poorly managed, poorly located and poorly equipped—and in order to secure the knowledge of what will be an average, it will soon be shown to all that are engaged in that industry that they must furnish the government information as to the conditions affecting the whole, and not part of it, and with these illustrations before them the legislators should and would soon see that the next step ought to be a law that will either encourage or require all interests of the kind to organize themselves into bureaus of information that will enable all engaged in them to know themselves, to know the demand and the supply, the cost and profit, and bring about peace instead of continuous warfare that is going on under the slogan, "Competition is the life of trade," which

when pursued as we are now following it, means only the survival of the fittest, and violent contentions, strife and death to all others.

Carlton has said: "Words unexpressed may sometimes fall back dead, but God himself can not kill them when they are said."

The labor organizations of this country—God bless them—have said that labor must be recognized, and with them I fully agree. Not that the members of a labor organization only shall be recognized, but that labor itself shall be recognized as the only thing that there is that enters into the cost of any article of any kind that is produced for any purpose.

It is true that the present labor organizations have abused their power in many instances, and they have been severely and justly punished for doing so, but their thoughts have been expressed, and neither God nor man can kill them.

Trade and commercial organizations have said: "We must come together in order to be able to conduct our business without failure and destruction;" and their thoughts have been expressed—and the time is coming when the laws of man will be made to conform with the laws of the Creator, and when they will be commanded by the laws of man to do so.

Let me recapitulate:

First—I maintain that all raw material of every nature and kind is a gift from the Creator, and as such, that there is no such thing as cost of raw material.

But be careful to distinguish between the word "cost" and the word "price." The price may be inflated by the trust or by a labor organization to a point where it is very much beyond the cost.

Second—That the only thing that enters into the cost of anything is labor.

Third—That the system of competition that arrays one group of the human family against another in a common strife for the same object resulting in altercations, violent contentions, fights, battles, death, is wrong.

Fourth—That this system can be changed by the laws of the government requiring all industries of like nature to form themselves into organizations and to become bureaus of information to show their right to continue as organizations, by being able to show that they do not abuse their power, either to starve their employees or to rob the purchaser to whom they market their goods.

ALUMINUM CASTING.

Nine years ago the casting of aluminum was an experiment. Having a low melting point and being easily handled in cast iron pots, castings from this new metal proved exceedingly attractive to many foundries. Then again the exceedingly high prices then prevailing, from \$.80 to \$1.25 a pound were inducements. No accurate knowledge of how it was affected by the oxidizing influence of the melting flame was obtainable and the difficulties encountered after losses had been sustained resulted in centralizing this work in a few shops where a specialty was made of it. To-day little trouble is experienced from the difficulties once encountered. Owing to its lightness, parts not subjected to severe strains are now made from it, such as aluminum crank and gear cases. The high shrinkage is overcome by the use of risers, and chills placed in the molds.

The growth of this industry has been coincident with the expansion of the automobile trade, and the industry will consume approximately 8,000,000 lbs. of aluminum per year. Automobile manufacturers are the larger users of aluminum in the world, although a large outlet for this metal is found in steel works where it is extensively used.

ALFRED REEVES SALES MANAGER OF UNITED STATES MOTOR CO.

Alfred Reeves, late general manager of the A.L.A.M., is now general sales manager of the U. S. Motor Company. Mr. Reeves has been identified with the automobile trade since its inception.

Automobile Department

FOR AND AGAINST THE WORM DRIVE.

Speaking with the confidence of the extended experience which the English branch of the industry has had, H. Kerr Thomas, of the Pierce-Arrow Motor Car Co., is prompt to express the opinion that unless the best of workmanship is available, any kind of worm gear is best left alone. The principal objection raised against the worm gear, however, does not concern any recognized difficulties connected with its manufacture but rather in its supposedly low efficiency.

The efficiency of worm gears properly designed and correctly mounted is as high as 95 per cent. Confirmation of this is given by Fred A. Halsey in his handbook on "Worm and Spiral Gearing." Since, however, the efficiency is said to be "relatively low," it may be interesting to turn to another authority in our attempt to find something higher.

In the Automobile Trade Directory will be found a table by Worby Beaumont, an engineer of high professional standing in England. Here it will be found that one set of gears will absorb 5 per cent of the efficiency and two chains 6 per cent, or a total of 11 per cent, giving for a bevel and chain transmission of the usual type of total efficiency of 89 per cent. against 95 per cent for a worm transmission.

Were it possible to employ for a large truck a single final bevel reduction, the efficiency of the bevel gear would be equal, but not superior, to that of the worm gear; owing to the size of gear which this would involve, such an arrangement is not possible, however, and chains must be employed, making the further reduction in efficiency referred to. Beaumont's figures, however, are for new chains, and it is a fact well known to all engineers that the efficiency of chains falls off rapidly as the chains become stretched, and the sprockets worn in use, so that 89 per cent, when new, is probably as low as 75 per cent long before the chains are worn out. It is therefore difficult to see in what way the efficiency of worm gears is "relatively low," particularly when it is remembered that the wearing of a worm and worm wheel does not reduce its efficiency at all, owing to the fact that the tooth sides are flat and remain so in spite of wear.

With regard to the so-called self-locking feature of worm gears, it is not a little curious that this point is so frequently brought up—it is obvious that no automobile could exist with a worm gear were it not possible to "coast" as freely as will a bevel, that it is difficult to conceive any engineer building such a machine unless he had first proved the fallacy of this impression.

Irreversible worm gears are so common in elevators and dividing heads of machine tools, that the uninitiated are apt to overlook the geometrical principles on which the operation of any worm gear depends, and which make it an easy matter for the designer to make the gear reversible or otherwise at his option; it is only a question of varying the gliding angle, which is always a function of, never equal to, but necessarily greater than, the spiral angle.

As to durability: Heavy trucks fitted with worm gear have been in general use in England for the last seven or eight years. In London omnibus work, where three ton chasses are employed in what is admitted to be the severest work which can be found, worm gears have given satisfactory results for the last five years.

The average life of a worm drive on an omnibus is between 28,000 and 30,000 miles; now that we have re-designed the torque rod the life should be 40,000 miles. I have yet to find any chain which will in average working approach one-half this distance.

Reliability is much the same as durability, but as the two are frequently considered separately I will deal with them in the same way, merely observing that, to take only one example,

Messrs. Dennis Bro., who are the pioneers of the worm drive for trucks, have given a specific guarantee of two years with every worm driven rear axle they have made, and their range of models has for five years included those of five tons capacity. Has any manufacturer of other forms of drive exceeded this?

Lastly, the argument of complication and unsprung weight and all the disadvantages thereof is such an old friend that those of us who have had some experience in the automobile industry have lively recollections of precisely similar objections when the gear drive was first substituted for chains in the lighter vehicle, such of us as are familiar with present day practice also know how far they were removed from the truth.

With regard to repairs: It is obvious that a broken chain can be easily repaired; it is equally obvious that such repairs are unnecessary if no chains exist. If a worm gear will last from 30,000 to 40,000 miles it may be assumed that roadside repairs are not a frequent occurrence, and as far as the axle itself is concerned, it becomes a problem of every day mechanical engineering to design what will be strong enough for the purpose.

Against the Worm Drive.

Machinery strongly deplores the advent of the worm drive, predicting that the move will be disastrous if generally followed by the builder of motor trucks.

The compactness and simplicity of the worm gear are generally attractive to mechanical engineers and designers and many have been led against their better judgment to use it in devices for which it is not suitable, says this writer.

A movement in the design of motor trucks to be deprecated is toward the use of worm drive in the transmission to the rear axle, a worm and wormwheel taking the place of bevel gears. We believe the move will be disastrous if generally followed by the builders of motor trucks, because reliability is required first of all in cars for commercial uses. Neatness of outline and freedom from noise are prime considerations in pleasure cars, but it appears like poor design to employ a rear axle in a heavy truck containing the differential and a worm drive, in place of the plain axle and a parallel lay shaft carrying the differential and chain sprockets for the intermediate transmission to the wheels. The latter form of drive is easily repaired; drivers can make shift to get along if one side is badly damaged, and are doing it every day. Hooking the rear wheel into an obstruction with force sufficient to bend the axle does not necessarily put the truck out of running, but it surely would if furnished with the worm drive and differential in the axle. Another disadvantage of the latter is the greater dead weight—that is, weight not spring supported—carried on the rear wheels as compared with the load carried by the differential rear axle type. The chain transmission gear may not be pretty, but if encased as it should be it is comparatively noiseless, highly efficient, long-lived, and simple to repair.

SOME SELDEN LITIGATION EXPENSE.

Some idea of the cost of the Selden patent litigation was disclosed recently by the announcement of the court's awards to the defendants in the suits which, after so many years of litigation, finally resulted adversely to the patent. The Ford Motor Co. and the C. A. Duerr Co., the one-time New York agents for the Ford car, were together awarded \$22,500.58, John Wanamaker, \$607.95, and the O. J. Gude Co., \$592.95. These amounts must be paid by the Association of Licensed Automobile Manufacturers, which stands for the Columbia Motor Car Co. and George B. Selden, in whose names the suits were prosecuted, and, of course, they convey no idea of the great cost to which the A. L. A. M. itself was subjected.

INTERIOR DECORATIONS OF MOTOR CARRIAGES.

The motor carriage for purposes of traveling has entirely altered our conception of what was possible as a reasonable day's journey and the speed at which it can be accomplished. This possibility, although seen when the motor carriage first became a practicable production, is now acknowledged almost universally, and, with the ability to cover the longer distances, there is an augmented desire that this should be done with the greatest degree of personal comfort, and there has been developed a style of carriage which is new and peculiar to the motor vehicle.

The open car is merely a development of the old mail or Park phaeton and the victoria, but the modern motor laudaulet and limousine, in the now accepted meaning of the words, are quite distinct carriages, constructed to suit the peculiar requirements of the chassis manufacturer, and, so far as their interior is concerned, decorated and finished for the comfort of the user. To these should be added the completely enclosed carriage, one of the most distinct motor creations. The interior fitting and decoration of these larger cars has been developed along lines which, in connection with the road vehicle, are entirely novel. The art of the upholsterer and the cabinet maker has been called in to assist and complete the work of the carriage builder. The materials generally used have not been altered, but the manner of dealing with them is entirely different. The demand for greater accommodation in the interior has necessitated the building of larger bodies, and this in turn has caused the carriage builder to seek to break up the large masses of cloth and leather in such a way that, while greater comfort is attained, the artistic effect is enhanced. It is here that the assistance of the cabinet makers' art has been sought, says *The Motor* (London). The provision of suitable recesses where odds and ends necessary for a protracted journey can conveniently and neatly be stored has suggested the cupboard and shelf, and from these have been developed those cunning contrivances, when, on occasion, there may be drawn a table or shelf and full equipment for a meal by the roadside of that light refreshment associated with noon and five o'clock.

It is not every car which is so completely fitted in this respect. There are occasions when the cool effects of freedom from dust and dirt are desired, and the necessary ceiling and upper portions which do not specially contribute to the direct comfort of the user are finished in sycamore, satinwood, walnut or mahogany, relieved with woods of darker or contrasting appearance. Sometimes harmony in combination with different materials is sought by using fine woods of shades approaching that of the cloth or leather employed for the seats and cushions, and these, when used with judgment, add to the artistic finish of the interior.

Not of less importance in obtaining the desired effect is the use of glass of fancy design and artistic workmanship, finished with the precious metals, which are put to so many services found to be necessary on a modern motor carriage.

The design and workmanship on these adjuncts to the interior fitting of a car may make or mar the scheme of decoration if they should not be in harmony with the general scheme or placed in such positions that, while they please the eye, they do not add to the reposeful effect of the whole.

Not less important than the serviceability of the interior decorations should be the artistic effect of the whole when completed. Glass in plain masses, suspensions of brilliant yellow or white-metal work outside, the color of cloth or leather and the brilliant polish and firm lines of cabinet work touched here and there with light, flashing, diamond-like, from cut glass and filigree metal, contribute to the effect, and any of these might be so used as to dominate the whole, destroying by the injudicious use of the means the effort to secure a desirable and artistic end. It is the artist accustomed to work in these different and varying materials who can so handle them that they are made to contribute their just share to one beautiful and serviceable scheme, which will secure that sense of repose which should be the effect upon the user of the modern motor carriage.

TESTS OF LUBRICATING OILS.

Owing to the fact that oils containing animal or vegetable matter leave a large percentage of carbon when burned, one of the prime requisites of cylinder oil is that it shall be of purely mineral origin. Likewise oils derived from an asphaltum base leave more carbon than those derived from a paraffin base. Therefore the next consideration is that the oil shall be of paraffin base. All oils contain carbon to a greater or less extent. The percentage of carbon they contain may be ascertained, but as it entails the use of delicate instruments and a laboratory the integrity of the refiner will have to be relied on in this respect. On evaporation, the oil should show not more than one per cent of carbon, and naturally the less it shows the better.

One of the principal difficulties of proper cylinder lubrication is due to the intense heat in which the lubricant has to perform its functions. Tests have shown that in engines of the water-cooled type the temperature of the cylinder walls varies from about 550 to 650 degrees Fahr. and it is reasonably certain that engines of the air-cooled type run even hotter. Though the heat is rapidly disseminated, it also is rapidly generated, the heat of the exploding mixture in the cylinders being in the neighborhood of 1,300 degrees Fahr. Some of the lubricant therefore is subjected to the latter temperature while the greater portion of it is exposed to temperatures which rarely drop lower than 550 degrees Fahr. and which occasionally rise as high as 700 degrees Fahr. Therefore it may seem that a cylinder oil in order to perform efficiently must withstand comparatively high temperatures before vaporizing.

As the result of experiments it has been found that oils which have a flash test of 400 degrees Fahr., which is the temperature at which they give off vapors which will ignite, will remain in a liquid state sufficiently long to perform the lubrication. It devolves, therefore, that another of the principal requisites for a cylinder oil is that its flash point shall not be lower than that temperature. To make the test a closed dish containing a quantity of the oil under test is embedded in sand in a larger dish and the whole placed over the source of heat. The cover of the dish in which the oil is contained is provided with two small holes through one of which a thermometer is inserted. As the oil heats, a match is applied over the remaining hole and the temperature at which the vapor ignites is the flash point of the oil. The burning point or temperature at which the oil will remain lighted usually is from 50 to 60 degrees higher, but as this is dependent on the flash point a consideration of the latter will be sufficient.

The viscosity of oil is its thickness, which is to say that an oil which is thick and flows slowly is of relatively high viscosity while thin oil is of low viscosity. As the viscosity of all oils becomes less as the temperature is raised, it is evident that in order to perform most efficiently at the high temperatures obtaining in the cylinders an oil must be of comparatively high viscosity. In this respect it is well to remember that the viscosity of oil is not always governed by the temperature and that some oils will become very much less viscous at lower temperatures than others. Logically the test for viscosity should be made at the temperature at which the oil is to be used, but as this is impracticable in the majority of cases, it will be sufficient to make the test at the temperature of boiling water, which is 212 degrees Fahr.

In making the test the oil may be heated by placing it in a small bottle and immersing it for a few minutes in boiling water. When the oil is hot a small portion of it should be placed in a pipette, which may be obtained from almost any druggists' supply house, and the number of seconds required for it to drop out noted. The same proceeding carried out with the various samples under test will give a comparative idea of the viscosity of the different oils. The oil which shows the greatest viscosity in this test, or, in other words, the oil which requires the greatest number of seconds to flow out of the tube, probably will be the

best to use, says a writer in the *Motor World*, provided other conditions are equal. In making the test for viscosity it must be borne in mind that oils which are of very high viscosity at high temperatures may be entirely too viscous to flow readily at the ordinary temperatures which obtain in the oil feeding devices.

The cold test to ascertain the temperature at which the oil ceases to flow also is of value. The congealing point may be determined by placing a small bottle of the oil with a thermometer in it in a receptacle containing a mixture of ice and salt and the temperature at which the oil ceases to flow noted. The specific gravity of the oil also is worthy of consideration and may be ascertained with a hydrometer. At 60 degrees Fahr. the specific gravity should be between 0.870 and 0.900.

Thus, summarizing, the best oil to use should be of strictly mineral origin and of paraffin rather than of asphaltum base. It should contain absolutely no animal or vegetable matter and should vaporize at not less than 400 degrees Fahr. At 212 degrees Fahr. the viscosity should be relatively high while at normal temperatures and almost down to the freezing point it should not be high enough to prevent it from flowing freely through oil pipes, etc.

GRANT TIRE PATENT AFFIRMED.

The Supreme Court Has Decided That the Grant Patent is Good.

The parties to the present suit were the Diamond Rubber Co., of New York, vs. the Consolidated Rubber Tire Co. and the Rubber Tire Wheel Co., the case being brought before the Supreme Court on a writ of certiorari obtained by the Diamond Rubber Co., after the Circuit Court of Appeals had decided against it and had refused to grant a hearing.

The patent in question is No. 554,675, issued to Arthur W. Grant on February 18, 1896. It covers a "rubber tire wheel" having a metallic rim with outwardly projecting flanges and a rubber tire in openings in which are inserted, throughout its length, separate and independent retaining wires.

While of vital interest to practically all of the tire companies identified with the automobile industry, the decision is of but small moment to the industry itself. The tire involved is a solid tire in which retaining wires are employed, but it chiefly is used on horse-drawn vehicles; the only automobiles on which it is or ever was employed are the light motor buggies. The patent does not cover the side wire tires or other solid tires which have been developed for use on motor trucks.

The legal fight over the patent has not only been prolonged but in some respects has been unusual. In 1906 in a suit for infringement against the Firestone Tire & Rubber Co., the patent was held to be valid by the United States Circuit Court for the Southern District of New York. Firestone appealed and on February 1, 1907, the Court of Appeals for the Second Circuit upheld the lower court. The action against the Diamond Rubber Co. of New York was instituted on June 10, 1907, and while it was pending, in a suit which previously had been brought against the Goodyear Tire & Rubber Co. in the Federal Court for the Indiana Circuit, that tribunal held the Grant patent to be invalid and void. The Grant interests appealed but the Court of Appeals for that, the Sixth, circuit denied the appeal and on a writ of certiorari the owners of the patent sought to have the case reviewed by the Supreme Court of the United States, which, however, refused to do so, an attitude which was reversed when the Diamond company took exactly similar action.

The patent thus seemed to be valid in one part of the country and invalid in another. The Diamond people fought in the same courts in New York in which Firestone previously had been defeated. They were beaten in both. In June, 1908, when the Court of Appeals considered the case, it plainly showed its impatience at having the same issues brought before it and declared that the Diamond interests presented nothing new, and added that "the indomitable persistency with which these people have fought for

the right to use the Grant tire is more persuasive evidence of its merits than the opinions of experts." Despite this and similar language which showed the disposition of the court the Diamond Rubber Company promptly applied for a rehearing, which was as promptly denied. The case was then carried to the Supreme Court on a writ of certiorari, which merely is a writ charging error in a lower court.

The merits of the entire patent were gone into, and while the court has announced its decision in favor of the Grant patent, its full decision has not yet been promulgated.

SECOND HAND PRICES.

There has been a feeling, we judge, that the second-hand value of a vehicle is not treated with a correct notion of its place in the scheme of merchandising the "used" product that is gathered in as a result of "swaps" in working off new product. The horse-drawn vehicle business has lived so long in a neighborly way with conditions of the sort that preachments about it would never occur to anyone as being called for, but the motor car makers are getting quite serious in discussion over the subject, and are arranging the whole matter to their satisfaction. The philosophy mixed up with the subject is set forth in our quoted extracts from a recent address:

"By 'improvident trading,' I refer to the practice of allowing customers a price for second-hand cars materially in excess of the real value of such cars, and in excess of the actual selling price of such cars, which, in effect, results in a cut price on the new car, and to this extent is a violation of the equitable principles of the one-price system. If it is a problem, like other problems, it has a solution. The solution lies in the channel of the application of common sense and equitable treatment. Primarily, it is a wrong to any automobile owner to persuade him to trade in a used car before he has had reasonable and proper service out of the same. If such a trade is made upon a basis equitable to the dealer, the owner of the used car is forced to sustain excessive depreciation upon his car, and if the used car is traded in on an improvident basis, the dealer is forced to lose his legitimate profit, and ultimately, will be incapacitated by financial losses from giving his customers such service as they are entitled to expect. On the other hand, if the dealer does not fail to give legitimate service to the owner of the car who purchased or traded for same on a cut price basis, it is manifest that the dealer must give the service at the expense of other customers, who purchased cars on a basis that afforded the dealer a profit.

"As second-hand cars must be reckoned with in some way, it is the duty of every dealer in automobiles to encourage the establishment of a permanent and reliable market for them. Assisting an automobile owner to dispose of his second-hand car on a proper basis is an obligation which rests upon every dealer, but a dealer, whose business it is to sell new cars, could not morally or legally be asked to buy or handle second-hand cars, if he does not so desire. There is no law, either statutory or moral, requiring any one to buy anything that he does not need or choose to buy.

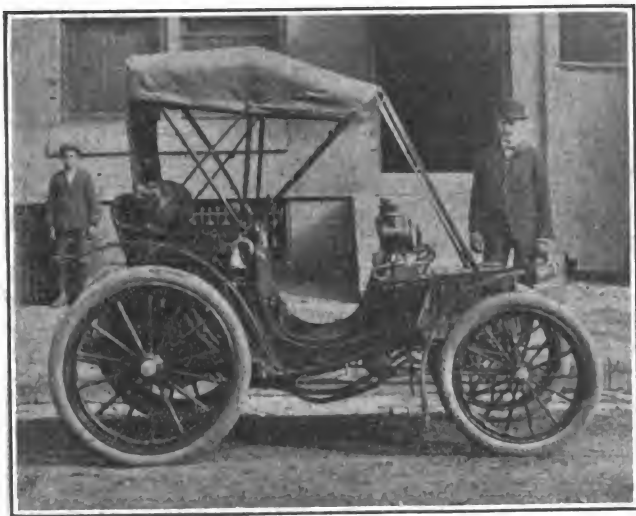
"Owing to the inherent nature of the motor car, it is not a machine which in any particular make can be successfully sold by different dealers in the same place. This is just as true of second-hand cars as new cars. The matter of service to be given after sale is made, remains a factor just as much, in degree, in the case of the second-hand car, as in the event of a sale of a new car. Dissatisfaction is bound to result, if responsibility for the sale of second-hand cars of any make is divided among different dealers. Under such circumstances, there is bound to be either unintentional or intentional misrepresentation relative to the condition of such cars, and buyers of second-hand under such conditions, are going to be misled. On the other hand, if the second-hand cars of a given locality are repaired and sold by a concern making the purchase and sale of second-hand cars its business, the second-hand car customer is more likely to know

what he is getting, and to get what he thinks he is purchasing, than under contrary circumstances. The sale of second-hand cars is a business of itself and must be so handled, as there is not more good reason for legitimate automobile dealers to take in second-hand cars in trade than there is for a legitimate clothing dealer to take in second-hand clothes in trade. It may take some time for proper principles to be evolved, but it is obviously to the best interest of all concerned to prepare for the changes in conditions which must eventually prevail."

VERY INTERESTING EXHIBIT.

Recently this journal commented upon the interesting display of old timers that were brought out by French enterprise and curiosity. The exhibit took the form of a parade, and owners and almost daily users of cars of a vintage of even ten years ago were in line; not beautiful, but useful, and a great testimony to worth of construction. We took the occasion as a test to air our skepticism on the probability of such an occurrence in this country being able to evoke any automobile ghosts able to stalk out of their graves, and show they could still stand on all fours.

We were surprised and gratified to get a quick response from Mr. Charles E. Duryea, the well known carriage builder, and as well known automobile engineer. One of the few men with engineer tacked to his name that can do his thinking over all parts of the vehicle and feel at home in his conclusions. Mr. Duryea has



Old-Time Duryea Car.

obliged us with a reproduction of one of his early efforts, now many years old and still in commission. We are pleased to present it for several reasons. In the first place as an example of stability. The carriage smith had to turn out the enduring kind of work, and again because the body is to this day more graceful in its lines and much more comfortable for the passenger to ride in than the major part of the more modern efforts. It would be a lesson in design and body suspension to many who believe they know the last word in such details. The diameter of the wheels is especially a comfortable riding factor and shows what might have been if the price of rubber had not been the actual wheel designer.

Altogether we are pleased to show Mr. Duryea's cabriolet.

GRABOWSKY OPENS NEW YORK BRANCH.

The Grabowsky Power Wagon Co., of Detroit, has established a branch in New York at 318 West 48th street. The Motor Maintenance Co., which several months since was absorbed by the United States Motor Co., had the Grabowsky metropolitan agency, which likewise was taken over and was continued for some time. But as the United States Company makes wagons of its own, the Grabowsky, by gradual process was relinquished.

TRYING FOR STANDARDS.

Engineers and Tire Makers Get Together But Nothing Final Decided Upon.

The standardization committee of the S. A. E. and representatives of tire manufacturers held a conference in New York on April 7. The standardization program was endorsed, but no standards were adopted; an understanding was reached that will enable the program to be carried out in time.

The tire makers were primed with the results of a preliminary conference, including a table of proposed standard load ratings for tires.

The tentative definitions of the committee on wheel dimensions for solid tires thus far arrived at apply to equipments of 36 inch nominal, or over-all diameter, the recommendations involving four different wheel or fellow band diameters for sectional tire sizes ranging from 2 to 8 inches. Beginning with the larger sections, the principal subject for discussion was as to whether the interests of the industry at large best would be served by making this diameter 29¾ or 30 inches.

Another point receiving attention was as to whether all wood wheels for solid tires should be permanently equipped with an iron band and whether the wheel diameter should be made to include the band. It is the recommendation of the committee that the bands be included, as it is agreed that this is necessary in order to preserve the condition of the wheels both in stock and in service.

As to thickness for the bands and the actual wheel diameters, certain questions of manufacturing expediency and differences of practice constitute complications which remain to be settled, though there was much sentiment in favor of making the wheel diameter the same for all widths of tires having a single nominal diameter. It was the sense of the meeting that for either single or dual equipments the dimensions should be the same for either both demountable and non-demountable tires. The committee's recommendation as to fellow widths is for the same dimensions as the tire width for single, and twice the tire width for dual equipment. A strong feeling that the fellow should be made ¾-inch less than the tire width developed in certain quarters, from purely structural motives.

The most important point is that of establishing a standard diameter over the band, or outer diameter in the case of the steel wheel, as this alone will serve to render different styles of equipment interchangeable on the same wheels and thus place the various tire manufacturers in open competition. As to whether tires below 3 inches sectional diameter should be standardized on a "truck" bases, or on standards that would render them interchangeable with pneumatic tires, is a point that is still open for discussion, as are a number of other questions, such as the load ratings of tires and the practice of truck builders in the matter of over or underloading tires.

Immediately in prospect is a submission of the minutes of the conference to all those who were present with an invitation for further comments and suggestions. With the working data thus obtained the committee will re-formulate the standards, afterward re-submitting them to the conferees for approval. The action of the society in formally adopting the final table of dimensions will follow in due season.

AUTOMOBILE INDUSTRY.

A preliminary statement of establishments manufacturing automobiles presents a comparative summary of the censuses of 1909, 1904, and 1899; an enumeration of the number, value, power and horsepower rating of gasoline, electric and steam automobiles; and also comparative general statistics showing the rapid growth of the automobile industry. The reports from the establishments were taken for the calendar year ending December 31, 1909.

The number of establishments increased from 57 in 1899 to

316 in 1909, an increase of 454 per cent in the 10-year period. Of the 316 establishments in 1909, 265 manufactured automobiles as a main product, while complete machines were a minor product, or "side line," with 51 of the establishments. The total product of the automobile industry increased in value from \$4,748,000 in 1899 to \$194,722,600 in 1909, an increase of 4,001 per cent.

A striking fact is the consistent development of the automobile industry in the states in which the carriage and wagon industry was of great importance. The inference is that, in a large measure, these states were equipped with the necessary skilled labor, thus giving the automobile industry an advantage and an impetus not enjoyed in other states.

The number of automobiles manufactured increased from 3,723 in 1899 to 127,289 in 1909, or 3,319 per cent. Of these, 126,570 were built in establishments of which automobiles were the main product, and 719 in establishments of which such machines were merely minor products.

In addition to Michigan, which led by a great preponderance, represented by about 45 per cent of the total product, the industry was of importance in these states, arranged in ranking order: Connecticut, 2,955 machines, valued at \$7,405,900; Wisconsin, 5,641, valued at \$7,157,500; Massachusetts, 3,467, valued at \$6,232,700; Illinois, 3,453, valued at \$4,485,500; Pennsylvania, 2,001, valued at \$4,151,300, and Missouri, 728, valued at \$1,074,300.

California, Maryland, Iowa, New Jersey, Minnesota, Colorado, Kansas, Kentucky, Nebraska, Oklahoma, Rhode Island, South Dakota, Tennessee, Texas, and Georgia had a combined product of 4,092 machines of the value of \$4,997,000.

A very large number of the automobiles listed as pleasure and family vehicles are used extensively as business conveyances. This fact can not be taken into consideration in a classification of the machines. For example, the machines listed as business vehicles number 3,288, while the total of pleasure and family vehicles is 122,505.

There is a perceptible general trend in the automobile industry toward specialization, which is manifested in a marked degree in all branches of the manufacture of vehicles. Much of the manufacture of automobiles consists of assembling the finished parts made by other establishments either as chief or minor products. Of the latter, foundries, machine shops, wheel works, body builders, rubber goods manufacturers, top makers, etc., will be found to furnish the greater values.

Independently of the factories which produce complete machines and parts incidentally, there is another group of establishments which produce bodies and parts, which eventually are used as materials by the establishments noted in the main table. There were in 1909, 476 such establishments reported, with a product valued at \$55,544,700. This does not exhaust all the establishments which contribute to the automobile industry, as there are others manufacturing such supplies in connection with other products, but for which separate statistics can not be compiled.

HOW ABOUT PRICE OF CRUDE RUBBER?

The India Rubber World sees a portentous thing in the following. It should tend to decrease prices of crude rubber, and generally stir up values:

The world, not the tropical world, but the temperate zone, possesses several million pounds of Para rubber that will shortly be offered to the trade at from 50 to 70 cents a pound. There will be a steady offering of it for years to come and the supply will increase. Its source is the worn-out motor tire that goes to the reclaimer and is thoroughly "recovered." For five years past the tire manufacturers have been turning out tons of tires and paying a high price for raw material. This great accumulation of rubber is just beginning to come back, and is of a grade that can be used in almost any line of work. Those who valorize must reckon with this great invisible supply as well as with the visible.

RATING COMMERCIAL AUTOS.

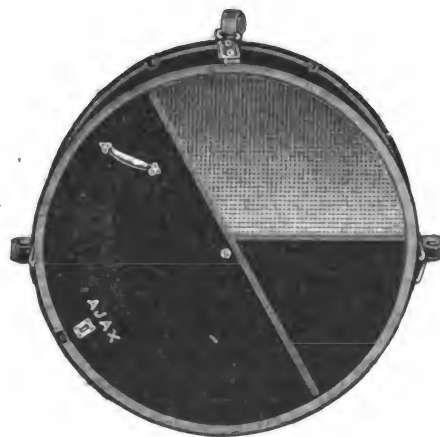
The situation in respect to the rating of commercial cars is entirely different from that which obtains in the other end of the industry. The rating of pleasure cars is confined to horsepower and passenger capacity. Horsepower is a term which has little real meaning in itself, and which really is significant only when interpreted in connection with a thorough knowledge of weight, gear ratio, engine and car speeds and even such apparently remote qualities as body design, balance and suspension. In the case of the commercial vehicle, however, the purchaser invests in a machine which is intended to perform a definite amount of work—work that is measurable in terms of weight and distance. Presumably he is able to define his requirement pretty accurately, and presumably he is willing to invest only in such equipment as is thoroughly suited to his needs.

But that is just the difficulty. The average motor truck buyer is not as well posted on his own needs as he should be and what is even worse, he is prone to load the vehicle to its utmost capacity a good deal of the time. He is accustomed to loading his horse trucks as heavily as they can be loaded and moved. He is apt to pursue the same simple plan with his trucks, and when they begin to show signs of wear or to break down, he promptly blames the manufacturer. Overloading thus has come to be one of the most prevalent evils with which the manufacturer has to contend.

The wise plan is that which already has been adopted by one far-seeing manufacturer, who practically has abolished the rating question, and sells his product only after he has thoroughly familiarized himself with the conditions under which it is to be used. After determining the size of the average loads to be transported in the regular run of the customer's business, he sells him an equipment composed of machines which are suited to that class of work.

REVOLVING DOOR TIRE TRUNK.

This is a guaranteed dust and waterproof tire trunk made by Ajax Trunk & Sample Case Co., of New York. The front and back are made of three-ply veneer basswood. The sides are good trunk board, all covered with black enameled duck. The back edge is bound with their patent steel angles, steel clamped



and riveted. On front edge of trunk, firmly riveted to body and reaching around the entire circumference, is a patent steel channel. In this channel the revolving door fits very closely and turns completely around, allowing full access to trunk. It is fitted with hasp and lock, and straps and buckles for fastening to shoe.

ADVANCE IN SWITCHING RATE.

The merchants of Atlanta, Ga., have formed a committee, among the members being B. M. Blount, of the White Hickory Wagon Mfg. Co., to fight the proposed increase of the railroad switching rate, which would impose about \$100,000 additional yearly expense on business in that center.

BRITISH CARRIAGE MAKERS DINE.

The annual dinner of the Institute of British Carriage Manufacturers was held at the Trocadero Restaurant, London.

G. J. Jacobs, in proposing The Worshipful Company of Coach Harness Makers of London said that in his humble judgment the most potent factor in the making of the eminent position to which English manufacturers had attained, was the foundation of the Craft Guilds which eventually became the great City Companies. They created a basis which culminated in the great exhibition of 1851, and they should bear in mind that those companies, those craft guilds, were not originally created by act of Parliament or Royal Charter, but they were evolved out of the consciousness of men who were determined that whatever happened their region should go into their work, and that work should be the best possible. In the first instance, they were the creation of men who gathered together in guilds and subscribed their gild or gold for one another's advantage, and for the common good of their craft. They arrogated to themselves such powers that they actually came into conflict with the authorities in London and the provincial towns, and in order to secure those powers they were obliged to obtain a royal charter. That was the way in which the city companies, though they were evolved from the trade guilds, obtained the charter in which all rejoiced. The work of those city companies was directed entirely, in the first place, to the maintenance of their industry, their craft and their workmen at the very highest possible degree; and not only in London, but in the provinces also, their liverymen were armed with such powers that they would visit the factories of the different members of the craft and destroy any workmanship which was slipshod.

The same thing was true with regard to the revival of art in Florence; they all knew that the trade guilds of Florence were the making of the great Renaissance. They need not treat the matter historically, but they could ask themselves what the great city companies had done of late years. They had raised one of the greatest monuments to this age of progress in the technical education given in the great City of London Guilds and Institutes, which had done such marvelous work that one could point to instances where trade, which had left the country had been won back again in competition. The Worshipful Company of Coachbuilders and Coach Harness Makers vied with the British Coachmakers in encouragement of younger members and in the establishment of technical education, which previously had been only for artisans, but which of late years had been given to those who would hereafter be the directors of their industry. But if the Worshipful Company of Coachbuilders had done nothing else, they had done a great thing for the workers in that industry by placing before them a motto which in the time of stress and strain of life was always before those who were connected with the industry, they had provided a motto they could look at and which had often proved a tower of strength. That motto was "Surgit post nubilae Phoebus"—after the cloud the sun rises.

Mr. E. Manville proposed the Toast of "The Institute of British Carriage Manufacturers," and said he felt greatly honored to occupy the position of president of the Society of Motor Manufacturers and Traders, a body which was very closely associated with their Institute. If there was one thing he wished to see more than another it was that those bonds which joined the two societies should be drawn tighter still. Nobody could deny that coachbuilding as it used to be understood was being replaced by coachbuilding in connection with motors. It was highly probable that in less than forty years there would be no horse-drawn carriages upon the road, and that meant that the whole art of coachbuilding in the future would be connected with the automobile. Under those circumstances it was perfectly obvious that the line dividing the two industries, which at present was so thin, would have disappeared once and for all. He knew they would agree with him that it was desirable in these days of competition, when everybody was doing his best to live, that there should be no wasting of time, and he wondered whether some means might

not be found of preventing that waste in connection with the two societies. He hoped they would not consider it impertinent on his part to make a suggestion—it was purely a personal one—but he could not see why their institute should not in the future deal with what he might call the technical or artistic part of coachbuilding and relegate to the Society of Motor Manufacturers and Traders what he might call the trade interests of their joint businesses.

Mr. Maythorn, speaking of the Olympia carriage and motor show, said: At the last show a member of a big firm of chassis makers said to him in a tone of disgust that the show had developed into a coachwork exhibition, and added that if he had his way he would put all the coach work on the other side of a curtained-off space. He (the speaker) retorted that he was quite agreeable to such an arrangement because he knew quite well on which side of the curtain the best of the visitors would be found. Their report this year contained a very cheerful note as to the prospect of trade in horse-drawn carriages, and he was sure they would all welcome any return on the part of the society to a regular use of the handsome equipages they all loved so well. Personally, he feared that some of them were a little too constant in their love, but it was to be hoped that the requirements for the Coronation would bring some substantial reward for that constancy. They hoped that the brave show horse-drawn carriages were bound to make during the state functions would rekindle such an appreciation for the graceful and the beautiful as would ensure carriages filling for the future their properly important position at all fashionable gatherings.

A FOREIGN VISITOR ON THE C. B. N. A.

An Australian carriage builder, Mr. Sage, was so impressed with those he met at the Cincinnati carriage builders' convention and so truly appreciated the motive that actuated the founders of the organization, that on his return home he printed his observations in a local trade journal. We are pleased to quote him:

"Everyone was full of business, and found in addition pleasure in meeting old friends, whom, probably, they had not seen since the previous convention twelve months ago. One thing which strikes the visitor very forcibly was the great camaraderie existing between the rival manufacturers of the same goods. They seem to have a much better feeling than similar business men in England or Australia. They exchange views, not only on qualities, but also on prices and customs of foreign trade, and impart information to each other, which in the case of other nations would be most jealously guarded. Taken as a whole, the assembled carriage builders struck me as being a very high class of intelligent men with whom it was a pleasure to become acquainted."

The observations of our Australian friend are decidedly correct, for, if there is any other business association in the United States in which the fraternal feeling is stronger than it is in the C. B. N. A., we have never heard of it. To quote an editorial, printed some time ago, "Year after year the members have met together in the business meetings, at the receptions and around the banquet board. In the convention halls, in the lobbies of hotels, they have joined together in groups for social conversation. Manufacturer meets manufacturer, the buyer meets seller, and through the association there is thus brought about a fraternal feeling that is as pleasing to contemplate as it is rare in trade associations whose objects to the casual outside observer would seem to be 'strictly business.'"

CARRIAGE COMPANY RE-OPENS.

The Scofield Carriage Co., Owosso, Mich., has started up again under charge of trustees. They expect to operate the factory until 200 jobs, which were in process when the works closed down are finished and placed on the market. General creditors would receive about 36 cents on the dollar, but the trustees hope to increase this percentage by converting the unfinished product into saleable buggies. Workmen have been paid.

REPORT OF FREIGHT AND CLASSIFICATION COMMITTEE.

C. A. Barnett, of the freight and classification committee of the Cincinnati Carriage Makers' Club has made a report on freight and classification that should be read:

The privilege of returning vehicles and their parts to manufacturers at half rate from points west of the Mississippi River has been cancelled. This was due to action taken by the Interstate Commerce Commission, which found that many abuses existed in the return to manufacturers of pianos, dry goods, and many other commodities, and they instructed the railroads to cancel the privilege. They, however, in their instructions, left it optional with the railroads to continue the half rate on vehicles and implements, provided it was done on the ground of small value and not on the ground of being returned.

A proposition is now under consideration by the railroads to restore the half-rate privilege, based on the valuation in case of loss or damage, of 50 per cent of invoice price for the goods when shipped new; the matter being considered by three committees, representing what are known as the Western Trunk lines, the Trans-Missouri lines and the Southwestern lines. These committees have not yet been able to agree and no definite action has been taken. It is probable that if they do not restore the privilege the matter will be again presented to the Interstate Commerce Commission.

For a number of years the official classification had a requirement shown in Rule 5, B note, that in order to entitle a shipment to the carload rate either the consignor or consignee must be the actual owner of all the goods in the car. This rule worked a hardship in many cases. It was ordered withdrawn by the Interstate Commerce Commission. The railroads appealed from the decision to the Supreme Court of the United States. On April 3 the Supreme Court handed down a decision upholding the order of the commission and therefore it is now permissible to load vehicles to any point in the United States without regard to the ownership thereof, so long as the goods are shipped in one day by one consignor to one consignee. This does away with all necessity for powers of attorney, affidavits, etc., which have been required for several years.

A recent decision of the Interstate Commerce Commission, known as Opinion No. 1457, Docket 3261, in the case of *W. K. Noble vs. Detroit & Toledo Short Line Railway*, is of great importance.

In this case a shipper loaded a car of cooperage stock which he insisted did not weigh to exceed 56,000 pounds. The railroad weighed it in transit and claimed that it weighed 66,000 pounds. The shipper's contention was that an average weight of 475 pounds per thousand hoops was fair. A test was made of similar hoops and they were found to weigh but 441 pounds per thousand. Railroad weights on thirteen carloads of exactly the same size and kind of hoops showed the average of but 436 4-10 pounds per thousand, and yet, because neither the consignor nor the consignee actually weighed these hoops and for the reason that the railroad had alleged to weigh them, the commission has decided that the railroad weights must stand, regardless of reasonable evidence to the contrary.

There is nothing left, therefore, for the vehicle shipper to do but actually weigh each particular job, in carloads or less, or pay whatever weight the railroad may assess, regardless of the facts in the case.

The railroads are following this decision and declining claims for overcharges based on estimated weights.

The Southwestern Association published in September, 1910, a set of rates to Texas, making very serious advances in the rates on carloads. The vehicle interests filed protest with the Interstate Commerce Commission, and as a result the rates were suspended. A meeting was had between the vehicle representatives and the executive officers of the Southwestern railroads and an agreement was reached as to an entirely new set of minimums

and rates, and same were to have gone into effect promptly; however, through some complications the agreed rates have not become effective, and the rates and minimums that have been in effect for two years are still in force.

Another conference has been called between the railroads and the vehicle interests, to be held in Chicago on April 21, at which the whole subject will be taken up again. It is impossible to predict what the outcome of this conference will be, as considerable opposition has developed from the farm wagon manufacturers to the agreement which was then made, which they consider altogether too favorable to light vehicles.

AMESBURY NEWS.

Reports from the West state that the people out there are hustling along as if the East was across the "pond" instead of being right at hand. Conditions along industrial lines out there are very good, although not booming.

From those reports local men should take hope, for if the factories out there are going well, ours will soon be the same. Even as it is, the Amesbury automobile body and carriage builders are just now receiving their first orders.

Howarth & Rogers, manufacturers of auto bodies, have received a large order and have just issued a hurry call for a score of body makers.

Other factories where the conditions are improving include the Amesbury brass foundry, where about 50 men are now busy; W. E. Biddle Co., who have now several orders to be filed at once; the Amesbury Metal Body Co., and Shields Carriage Co., both companies keeping up the work they have been doing; J. N. Leitch & Co., where many men have had steady work throughout the winter, and the S. R. Bailey Co., the only local manufacturer of the whole auto. At the latter shop men are being taken on every day, and prospects are daily brightening.

At the two lamp factories, Gray & Davis, and the Castle Lamp Co., conditions are better, but have been good all the season.

Among all the local shops several have been conspicuously busy all through this usually slow year. Briggs' Carriage Co., T. W. Lane, Clark Carriage Co., and the lamp factories.

But all this, time the need of several concerns who could manufacture the whole automobile has been seriously felt. It is believed that sooner or later that those great auto firms of the west, which now depend on Amesbury for their auto bodies, will commence making them themselves. Then the local shops will be left in the lurch. If a large firm could be induced to take up operations here in building body and engine, a great impetus would be given this town which has always been among the foremost of building centers.

FIRST BASKET-SEAT BUGGY.

To C. G. Cook, president and head of the trimming department of the Cook Carriage Co., of Bloomville, Ohio, belongs the distinction of having made the first basket-seated buggy ever manufactured in the United States.

"It came about in this way," says Mr. Cook. "One day while working for the Peabody Buggy Co. at Fostoria, a traveling salesman who had visited Europe and seen this peculiar style of buggy, asked me why I didn't make and try to put upon the market some of these buggies, as they were all the rage in Europe. He drew up a rough sketch, as he had remembered it, on paper, from which I designed and manufactured a basket-seated buggy. After the rig was finished it was placed in the company's repository and offered for sale. Everyone who looked at it admired it but being so much out of the ordinary in shape, no one at that time had the nerve to buy and use it. The odd-shaped vehicle set in the show room for a number of years, some of the employes at times using it as a conveyance to go fishing as the seat was roomy and accommodated quite a number of people. About ten years from the time this buggy was made, others of a similar pattern came upon the market and were great sellers."

OBITUARY

H. G. SHEPARD.

H. G. Shepard, senior member of the firm of H. G. Shepard & Sons, New Haven, Conn., died at his home at Short Beach, Conn., on Saturday, April 22, after a brief illness. He was born in Branford, Conn. Since the early 70's Mr. Shepard directed the affairs of the wood bending company, but for some time past he had resigned business cares to his sons while he lived in his country home at Short Beach. He was considered an authority on all matters pertaining to vehicle timbers and the bending of woodstock for carriage and automobile construction.

For many years Mr. Shepard was a familiar figure at the conventions and exhibitions of the Carriage Builders' National As-



H. G. Shepard.

sociation, but owing to his advancing age he was not able to attend the last few annual gatherings.

During his lifetime Mr. Shepard had done considerable literary work, and many of his writings were published in *The Hub*. The late G. W. W. Houghton, editor of *The Hub*, and Mr. Shepard were warm personal friends, and Mr. Houghton's enthusiasm for Mr. Shepard's work and abilities may have been a grateful impetus to Mr. Shepard's technical contributions. Mr. Shepard was one of the very first as a writer and speaker to impress on his audience the importance of conservation of hardwood timber for carriage building purposes, and his influence was widely felt.

Personally Mr. Shepard was a charming personality. Modest, ripe in learning, and full of kindness and sympathy. A true friend and a fine man.

William Alexander Elmendorf, president of the Elmendorf Varnish Company, Chicago, and one of the three men who placed in service the first sleeping car on the Illinois Central Railroad, died early Saturday morning, April 8, at his home at 938 La Salle avenue. His health had been failing for almost two years. Death was due to a complication of diseases. Mr. Elmendorf was born in Oswego, N. Y., March 29, 1829, the son of John S. and Elizabeth Whaley Elmendorf, and was educated in the Boys' Academy at Albany, N. Y. His early business experience was gained in a grocery store in Hudson, N. Y., following which he spent two years in California. Then he returned to New York City and engaged in the produce business from 1855 to 1859,

during which latter year he moved to Chicago. In 1872 Mr. Elmendorf established the Elmendorf Varnish Company and he was engaged in its management until he retired from active commercial life in 1909. In 1899 his son Willard was taken into partnership and for the past three years has managed the business.

He married Sarah Billings Allen, and two years ago they celebrated their golden wedding anniversary. Mr. Elmendorf was a member of the Paint, Oil and Varnish Club. He is survived by his widow and two children, Mrs. O. H. Bardwell and Willard Elmendorf.

It is understood that the death of the head of the Elmendorf Varnish Company will in no way interfere with the operations of the concern, which will be conducted as heretofore, under the management of his son and partner, Willard Elmendorf, who for several years has been in active control of the affairs of the company.

Frank D. Suydam, Sr., president of the Milburn Wagon Co. and Toledo Bending Company, died April 17 at the Toledo hospital, where he underwent an operation for appendicitis. Three weeks previous Mr. Suydam, with his wife, was summoned from the South on account of the dangerous illness of his son, Horace D. Suydam, and he was taken ill soon after reaching home. Mr. Suydam had been connected with the Milburn company since it was established in Toledo, in 1873. He was secretary first and for 20 years has been at the head of the company. His wife survives him, together with two sons, Horace D., secretary of the Milburn company, and Frank D., Jr., manager of the sales department of the company, and two daughters.

Ezra E. Fisher, 72, after an illness of a little over one week, died at his home in West Brattleboro, Vt. He was born in Brookline, December 29, 1838, and was one of a family of twelve children of Asa and Mary (Streeter) Fisher. He was about 10 years old when his parents moved to Brattleboro. When a young man he was employed for a time in the skate shop in that village and afterward worked in the Williston carriage shop. He engaged in the manufacture of ox bows and wagon hubs in the old tannery building at West Brattleboro for several years. Upon his return from the Civil War he formed a partnership with John Henkel and for some time was engaged in the manufacture of furniture at West Brattleboro. A wife and four children survive him.

John Lawall, aged 62, died at Butler, Pa., April 21. For many years he was associated with his brother, the late Jacob Lawall, in carriage and wagon making. A sister survives.

THE VALUE OF QUALITY.

All works of quality must bear a price in proportion to the skill, time, expense and risk attending their invention and manufacture. Those things called dear are, when justly estimated, the cheapest. They are attended with much less profit to the artist than those things which everybody calls cheap. Beautiful forms and compositions are not made by chance, nor can they ever, in any material, be made at small expense. A composition for cheapness, and not for excellence of workmanship, is the most frequent and certain cause for the rapid decay and entire destruction of arts and manufacture.—Ruskin.

TECHNICAL SCHOOL CLOSING.

The Technical School for Carriage and Automobile Drafting closed for the season the fifth of April, having had a successful year. Six graduates from the day and evening classes were: William J. O'Donohue, Louis H. Heipp, Arnid Johnson and Edward J. Williams, of New York City, and Frank W. Pierce, Amesbury, Mass., and William M. Gray, Chatham, Canada. The correspondence department continues throughout the year, instructing hundreds in all parts of the world. Professor Andrew F. Johnson has much reason for satisfaction at the success he has achieved.

Trade News From Near and Far

BUSINESS CHANGES.

T. A. Smith has purchased the stock of buggies, etc., of C. B. Olson, in Buxton, N. D.

J. H. Thomas has disposed of his buggy business in Trenton, Neb., to M. M. Brumley.

Andrew Olson has purchased the vehicle business of Bemis & Bleecker in Ashby, Minn.

B. C. Matthews has disposed of his stock of vehicles in Ogalala, Neb., to S. P. Andrews.

G. T. Miller has purchased the stock of vehicles, etc., of McCay & Sons, in Fullerton, Neb.

Joseph Coates has succeeded to the vehicle business of Ceigley & Coates, in Shelbyville, Mo.

H. A. Wright, a dealer in vehicles, etc., in Leon, Ia., has moved his stock into a new location.

N. N. Rockwood has purchased the stock of vehicles, etc., of George Tims, in Alburnet, Ia.

Ahern & Wolf have purchased the stock of buggies, etc., of Chas. Fowler, in Friend, Neb.

Comer Bros. have disposed of their stock of buggies, etc., in Page, N. D., to Brudevold Bros.

Chas. A. Myers has purchased the stock of vehicles, etc., of Bray & Baker, in Sumner, Wash.

C. E. Knepper has disposed of his stock of vehicles, etc., in Douglass, Neb., to John Patterson.

Salisbury & Jobin have purchased the stock of vehicles, etc., of H. P. Jensen, in Mankato, Minn.

A. B. Elvestrom has purchased the implement and vehicle business of Lars I. Flo, in Bricelyn, Minn.

Vessey & Dill have purchased the stock of vehicles, etc., of Dieter Bros. & Dankey, in Madison, Neb.

Brann & Davison have disposed of their stock of vehicles, etc., in Scotland, S. D., to Rickgaue & Peterson.

Thos. C. Martin has purchased the vehicle and implement business of A. B. Baker & Co., in Pullman, Wash.

John Stainocker has disposed of his vehicle and implement business in South Shore, S. D. to Sriver and Beskow.

Deibert Bros. have disposed of their stock of vehicles, etc., in Sylvan Grove, Kas., to L. A. Greiger, of Goodland, Kas.

A. T. Rutledge has succeeded to the entire implement and vehicle business of A. T. Rutledge & Co., in Belgrade, Mont.

Thompson Bassett Co., Ypsilanti, Mich., manufacturers of whiffletrees and neck yokes, has changed its name to U. S. Pressed Steel Co.

Jack Behan and J. A. Sorg purchased the L. D. Hare Carriage Works of Webb City, Mo. Mr. Behan was in charge of the paint and decorating shops of the Southwest Missouri Railroad Company for twelve years.

Crossen & Seaver, Joliet, Ill., is now the name of the firm that has been known for years as the R. W. Crossen Carriage Co. The new firm has added the agency for the Maxwell automobile to their carriage manufacturing business.

John Kernan has purchased and taken possession of the carriage repairing business of E. A. McGraw, known as McGraw's wagon shop, Cortland, N. Y. The McGraws have been in the business of repairing wagons and selling wagon parts for over twenty years and feel that they have earned a vacation.

NEW FIRMS AND INCORPORATIONS.

Cox & Kline have opened a stock of buggies, etc., in Ewart, Ia. Eckerson Motor and Carriage Works, Closter, N. J., capital \$25,000; has been incorporated by Garret D. Eckerson, Howard

M. Bertody and Dwight G. Moore. The company is to manufacture automobiles, carriages, etc.

W. A. R. Page, Meadville, Pa., has opened a wagon repair shop.

Ed. Bertrand is about to engage in the vehicle business in Cobden, Minn.

M. Paulson is about to open a stock of vehicles, etc., in Rice Lake, Wis.

Blaha & Morson have engaged in the vehicle business in Hurdsfield, N. D.

John Sullivan has engaged in the vehicle business in Bone-steel, S. D.

W. J. Walters has opened a new stock of buggies, etc., in Hedrick, Ia.

Motor Wagon Co., Detroit, Mich., has been incorporated, capital, \$150,000.

Frank Mahowald is opening a new stock of vehicles, etc., in Mankato, Minn.

Wm. R. Dennis is opening a new stock of vehicles, etc., in Rothbury, Mich.

John Clements has just opened a new stock of carriages, etc., in Gladbrook, Ia.

H. J. Noblet has engaged in the implement and vehicle business at Springfield, Wis.

The Goodner-Krumm Co. has opened a new stock of buggies, etc., in Hydro, Okla.

Moore & Collier have opened a new stock of buggies, etc., in Eaton Rapids, Mich.

Augustus Hendrix has opened a stock of vehicles, hardware, etc., in Hawarden, Ia.

Wingate & McGuin have opened a new stock of vehicles, etc., in Independence, Kas.

John Steltzreide has opened a stock of vehicles and implements in Saginaw, Mich.

Chas. Gustafson & Sons have engaged in the vehicle business in Thief River Falls, Minn.

J. E. McFarland contemplates the establishment of a buggy factory in Forest City, N. C.

At Holly, Mich., the Carter Dump Wagon & Mfg. Co. has been incorporated; capital \$100,000.

Galyardt & Millberger have engaged in the vehicle and implement business in Olmitz, Kas.

E. A. Barnes & Co. are about to engage in the vehicle and hardware business in Beloit, Wis.

The Williams Wagon Works has been incorporated in Macon, Ga., with a capital stock of \$12,000.

George Lippman has established himself in the vehicle and implement business in Granville, N. D.

T. A. Baldwin has established himself in the vehicle and implement business in Emmettsburg, Ia.

Hurdle & Carlock have established themselves in the buggy and implement business in Como, Tex.

The C. M. Pettigrew Co. has been incorporated in Tiskilwa, Ill., to handle implements and vehicles.

The Simon Auto Top Co. has been incorporated in Kansas City, Mo., with a capital stock of \$3,000.

The Michigan Adjustable Hub Co. has been incorporated in Detroit, Mich., with a capital stock of \$100,000.

The Garden City Buggy Co., of Garden City, Mo., is reported about to establish a factory in Fort Smith, Ark.

J. E. Mallory, Carthage, Mo., recently employed with the Laupher Carriage Works, has opened business for himself.

The Ohio Auto Accessory Company, of Columbus, O., capital

\$30,000; has been incorporated by Nathan Meyer, A. E. Shatford, W. E. Wetherholt, William Bott and J. H. Smith.

The Peck Wheel Co. has been incorporated in Chicago, Ill., with a capital of \$100,000, to handle vehicles and vehicle wheels.

The Texas Buggy Co., Sherman, Tex., has been incorporated with a capital of \$10,000 by N. B. Biger, Thomas Forbes and M. C. Dorset.

Consolidated Automobile Co. has been incorporated at Anderson, Ind., by Henry Nyberg, Harry Hamilton, P. H. Doyle; capital \$50,000.

The Paola Implement & Vehicle Co. has opened for business in Paola, Kas. J. M. Rohrer, Chas. F. Emery and Wilbur Downs are interested.

Ideal Wheel Co., Cincinnati, O., to manufacture wood wheels, has been incorporated with a capital of \$25,000 by B. L. Mattox, Paul Will and Michael Kuhn.

Universal Truck Co., capital \$50,000 to deal in, rent, repair and manufacture automobiles; incorporated by W. J. Hughes, Brooklyn; R. J. Donovan, New York City.

The Apex Wagon Company, Auburn, N. Y., has been organized by William Atkins, E. N. Ross and W. A. Tice. The company is to engage in the manufacture of wagons.

Hines Buggy Company, Boykins, Va., has been incorporated by W. W. White, president; R. H. Powell, vice-president; G. T. Beaton, secretary and treasurer; capital \$25,000.

Richmond (Ind.) Lamp Manufacturing Company, capital stock, \$50,000; has been incorporated to manufacture carriage and other lamps; by J. M. Judson, J. C. Ingram and F. W. Judson.

The Utah Implement & Vehicle Company, Salt Lake City, has been incorporated, capital \$250,000; by W. S. McCormick, J. O. Critchlow, Elmer B. Jones, A. B. Irvine, J. C. Greendyke.

Westman Motor Truck Co., Cleveland, O., has been incorporated to manufacture motor trucks; capital \$200,000, by L. A. Westman, C. J. Jennings, George E. Karl and Wm. H. Westman.

Laughlin & Kelley Co., Antigo, Wis., hardware, implements and vehicles, has been incorporated, capital, \$25,000; by J. J. Laughlin, P. G. Kelley, Nellie J. Laughlin, Katherine Kelley.

The Racine (Wis.) Supply Company, vehicle and implement dealers, capital \$10,000; has been incorporated by W. A. Flesher, E. S. Beegle, W. P. Carver, Mary E. Flesher and John W. Cross.

The Springfield (Mo.) Carriage Co. has opened a factory at the old stand of G. E. Elsey & Co. W. T. Elsey, formerly of Aurora, is manager. He has been in the carriage business 25 years.

St. Louis (Mo.) Automobile and Engine Company; capital \$50,000; has been incorporated by W. D. Williams, Charles F. Keene and Frank H. Braden, to deal in automobiles and steam engines.

Eastern Parkway Automobile Co., Brooklyn, N. Y., capital \$10,000, to manufacture motors, engines, motor vehicles, has been incorporated by Harry Meisner, 1839 Prospect Place, and C. Palash, 435 Rockaway avenue.

The End Wood Brake Company, of Cincinnati, has been incorporated for \$30,000 by Charles C. Maddock, Charles E. Brigel, Bernard Kaus, C. W. Miles, and Carl H. Barth. The concern is located at 119 Opera Place and manufactures a patented wagon brake.

IMPROVEMENTS—EXTENSIONS.

The Lowell (Mich.) Cutter Co., has increased its capital from \$75,000 to \$125,000.

The Selma (Ala.) Spoke Co. has increased its capital stock from \$10,000 to \$25,000.

Geo. W. Davis Carriage Co., (Richmond, Ind.) has increased its capital from \$30,000 to \$60,000.

Anderson Electric Car Co., Detroit, Mich., has increased its capital from \$1,200,000 to \$2,500,000.

The Hannibal (Mo.) Wagon Co. has increased its capital from \$55,000 to \$75,000, and is enlarging its plant.

The Warner Manufacturing Company, of Toledo, manufactur-

ers of automobile parts, contemplates building a new plant in that city.

The Von Behren Manufacturing Company, Evansville, Ind., manufacturers of spokes and hubs, will build a new addition to its plant, to be 40x60 feet.

Beutel Bros., Manitowoc, Wis., have purchased additional property and will erect a four story brick building to be utilized in the manufacture of automobiles.

A fireproof paint-grinding building is being built as an addition to the plant of the Freeport (Ill.) Carriage Company. It will be a one-story structure, twenty by forty feet.

L. R. Wilkinson is putting up a new building at Locust Valley, N. Y., his increasing business requiring additional facilities. A. J. Thomas, carriage painter, will occupy a part of the building.

A two-story brick building is being erected for the use of the Dublin Buggy Company. This factory has been in operation here for several years and now must enlarge to take care of the business.

Sifly & Frith, of Orangeburg, S. C., are excavating preparatory to the erection of a large brick building. This firm will use the entire lower floor of the building for its huggy, wagon, harness, etc., business.

A large addition to the Junction plant of the Mitchell-Lewis Motor Company, Racine, Wis., is being made. The new addition will be of concrete construction, and will measure 25x150 feet. Like all of the factory buildings of the automobile company it will be only one story high.

The two large additions to the plant of the Pierce Motor Company at Lakeside, Wis., have been completed, and one of them is now being occupied by the concern. The buildings were erected because of the lack of room in different departments and will be used for finishing purposes.

The Lake County Wagon Works, Leesburg, Fla., has moved into its new building, built of corrugated iron, with cement floor. It is a two-story building with a garage, blacksmith and horse-shoeing department, and on the second floor a painting and upholstering department. T. W. Jay is proprietor.

The Garford Co., of Elyria, O., manufacturers of automobiles, has increased its capital from \$650,000 to \$2,000,000. The company has just completed a new factory building 150x80 feet, three stories high, where Garford trucks and municipal public service wagons will be made exclusively and these branches in addition to larger pleasure car business have made capitalization desirable. The new capital stock will consist of \$850,000 in common stock and \$500,000 in preferred. The common stock will be paid for out of the surplus fund, which amounts to \$950,000, and it is reported it will go to the present shareholders without cost. The preferred stock will be sold.

BUSINESS TROUBLES.

The old Sterling Buggy Company property at Rushville, Ind., was sold at sheriff's sale to Clifford & Reynolds.

Lawyers for the minority stockholders of the Coquillard Wagon Works, Henderson, Ky., protested in the Circuit Court against the sale of the property to the Henderson Wagon Works at \$186,000.

A jury in the case of Perry Gossett vs. The O. Armleder Company, Cincinnati, Ohio, returned a verdict in favor of the defendant. Plaintiff brought suit for \$10,000 damages for injuries sustained by falling through an open elevator shaft.

The Iowa Manufacturing Company, Oskaloosa, Ia., filed a petition in the federal court. More than eighty creditors are listed in the petitions and the amounts owed them range from a few dollars to \$7,480, the largest of which is owed the W. W. Corey Company, of St. Louis, Mo. The assets of the concern are listed at \$86,247.20, and the liabilities \$91,581. A majority of the company's assets are listed as open accounts.

Trustees closing out the business of the Electric Vehicle Co. have filed an order in the New Jersey Court of Chancery asking

for permission to distribute the balance of the fund available from the sale of the assets between the common and preferred shareholders alike, and also asking for their discharge. A hearing on the application was held May 8 in Camden. The trustees' report shows that a total of \$213,667 was collected; counsel and trustees' fees are \$75,573, leaving a balance for distribution of \$137,914.

FIRES.

Dalton (Ga.) Buggy Co. burned out. Loss \$30,000.

William Stein, Aledo, Ill., sustained a fire loss. Amount not stated.

Fire at Sapulpa, Okla., destroyed the Nickerson Vehicle store; loss not given.

Fire in S. Y. Kern's carriage works at Cooperstown, Pa., caused a damage of about \$100.

Fire destroyed the building of the W. S. Frazier Vehicle Company, Aurora, Ill. Loss not given.

Fire at Anselmo, Neb., destroyed the Baker stock of hardware, implements and buggies. Loss \$8,000.

A small fire in the wagon shop of Kondolf Brothers, Rochester, N. Y., was extinguished with slight loss.

Fire caused \$1,000 damage in a building used for storing excelsior at the plant of the Staver Carriage Company, Chicago, Ill.

Fire destroyed the five-story brick building of the Killom & Killom Carriage Company, New Haven, Conn. Loss is \$200,000.

Seventeen automobiles, valued at \$30,000, were destroyed by fire which attacked the factory of the Johnston Carriage Company, Williams street and Harlem avenue, Oak Park, Ill. The fire destroyed the interior of the third floor, in which the machines were stored.

The United States Carriage Company, Columbus, O., is now rapidly repairing the damage done to its plant by fire some weeks ago, and in a short time will have the plant in better condition than before the fire. While the fire did considerable damage, it did not cause the closing down of the factory and work has been going steadily ahead.

PERSONAL.

P. N. Porter, who has been assistant manager of the Henney Buggy Company for the past two years, has resigned his position.

C. H. Stonesifer, carriage maker, Hagerstown, Md., and Miss Minnie Cook, daughter of Mr. and Mrs. Samuel Cook, of Reid, Md., were united in marriage.

C. C. Fisher, who formerly represented the Staver Carriage Company in southern Wisconsin and northern Illinois, has accepted the position of assistant sales manager of the Emerson Carriage Company, of Rockford, Ill.

Philip Weller, proprietor of the Avenue Carriage Works, St. Joseph, Mo., was painfully injured when his left hand was caught in a planing machine. Two fingers of his hand were so badly mangled that they were amputated.

Chas. Eckart, president of the Eckart Carriage Co. and Auburn Automobile Co., is reported quite ill at his winter home at Los Angeles. His illness is said to be of a serious nature. He is quite advanced in years and friends fear for his recovery.

W. F. Evans has been elected superintendent of the plant of the Moline Wagon Company. He takes the position made vacant a little more than a year ago by the election of A. L. Moore to be general manager of the plant. Since that time the institution has been without an active superintendent.

SECOND LARGEST.

When you speak of C. D. Franke & Co., of Charleston, S. C., you are naming the second largest carriage and wagon supply establishment in America. The business is in charge of Mr. Julius H. Jahnz. The firm has a total floor space of 125,000 square feet. Several additional warehouses were recently completed, and these in addition to the office building, salesroom and store, make the firm one of the most substantial appearing in South Carolina.

PROCEEDINGS OF MERCHANTS' ASSOCIATION.

We acknowledge a pamphlet of the proceedings of the Merchants Association of New York, organized to foster the trade and welfare of New York. Its activities, as shown by this record of its year's work, have been altruistic, as the good accomplished has reflected upon other towns to their advantage, too.

NEW ASSOCIATION.

The Arkansas Valley Retail Implement and Vehicle Dealers' Club has been formed at Junction City, Kas. The organization is a branch of the Western Retail Implement and Vehicle Dealers' Association.

RECENTLY EXPIRED PATENTS OF INTEREST TO THE VEHICLE INDUSTRY.

Patents Expired February 13, 1911.

514,446—Vehicle Brake. Mordecai A. Davidson and Frederic R. Lock, Sheridan, Mo.

514,507—Running Gear. Aaron H. Sensenig, Farmersville, Pa.

Patents Expired February 20, 1911.

515,089—Vehicle Spindle Nut. Robert W. McClelland, Valley Center, Kansas.

515,099—Truck for Vehicles. William Voss, Dayton, Ohio.

515,264—Automatic Wagon Brake. Frithiof A. V. Thelander, Stockholm, Sweden.

Patents Expired February 27, 1911.

515,392—Vehicle Wheel. Matthew C. Yarwood, Syracuse, N. Y.

515,407—Vehicle Tongue. Andrew B. McKay, London, Canada.

515,456—Vehicle Wheel. Rosto O. Wood, Worcester, Mass.

515,518—Vehicle Wheel. George S. Crosby, Buffalo, N. Y.

Patents Expired March 6, 1911.

515,904—Vehicle Wheel. William H. Detter, Denver, Colo.

515,072—Wheel for Vehicles. William Bonnar, Boston, Canada.

516,149—Vehicle Wheel. Arthur M. Allen, West New Brighton, N. Y.

Patents Expired March 13, 1911.

516,283—Combined Brace and Brake Support for Vehicles. Benjamin F. Sweet, Fond du Lac, Wis.

516,400—Tie Chain for Vehicle Bodies. Thomas M. Nalton, Syracuse, New York.

516,567—Vehicle Running Gear. Joseph F. Fry, Wever, Iowa.

Patents Expired March 20, 1911.

516,986—Band Brake for Vehicles. James S. Cortland, Hartford, Conn.

Patents Expired March 27, 1911.

517,203—Vehicle Axle. George H. Westinghouse, Buffalo, N. Y.

517,235—Ball Bearing for Vehicles. David Pettit, Beverly, N. J.

Patents Expired April 3, 1911.

517,791—Metallic Vehicle Wheel. Corodon S. Cannon, Battle Creek, Mich.

The above lists of patents, trade marks and designs of interest to our patrons are furnished by Davis & Davis, solicitors of American and foreign patents, Washington, D. C., and St. Paul Building, New York City.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word. Initials and figures count as words. Minimum price, 30 cents for each advertisement.

HELP WANTED.

Wanted—A young draughtsman competent to take charge of cost department. Give age, experience and salary expected. Henney Buggy Co., Freeport, Ill.

Blacksmith Foreman—A first-class smith for up-to-date Canadian carriage factory turning out from 10,000 to 12,000 jobs per year. Must have the executive ability to handle his men and equipment to the best advantage. State age, experience and wages expected. Box 97, care The Hub, 24 Murray street, New York.

Wanted—Painter for truck and bus work, must be good letterer and first class painter. Fifty cents an hour, steady work, no labor trouble. Address B. F., 96 care The Hub, 24 Murray street, New York City.

Painter Foreman—Canadian carriage factory turning out about 10,000 jobs per year requires a foreman that can turn out high-class work and get best results from his department. In replying please give age, experience and wages expected. Box 98, care The Hub, 24 Murray street, New York.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.



Painters and Decorators Save Time, Labor and Money, using the

Uebelmesser Striping and Stencil Wheel

With this simple, clean and rapid-action tool the most ordinary decorator can do the finest striping and stencil work and produce a bigger day's work with less labor than by the old fashioned method. Complete directions are furnished with each tool. They are as simple as the tool itself.



Just a few of the many designs that can be produced with the Uebelmesser Painters' and Decorators' Tool. (The designs shown above are reduced in size)

Complete Outfit consisting of Machine, 10 Plain and 10 Ornamental Wheels, only... **\$5.50**

LIBERAL DISCOUNT TO THE TRADE

Manufactured by
Charles R. Uebelmesser Company
Bayside, New York, N. Y.

INDEX TO ADVERTISEMENTS.

American Ball Bearing Co., The	16
Ault & Wiborg Co., The	3
Bailey & Co., Inc., S. R.	18
Barbour Steel Tire Co.	4th cover
Bokop, Webb & Palm	14
Columbus Bolt Works	4th cover
Consolidated Rubber Tire Co.	2nd cover
Crane & MacMahon	2nd cover
Decker, J. C.	3rd cover
Devoe, F. W., & Raynolds Co., C. T.	3rd cover
Eccles Co., Richard	14
Enterprise Foundry, The	12
Gerhab, Jacob	4
Gifford & Son, John A.	14
Goodrich Co., B. F., The	5
Goshen Eyelet Co.	18
Gramm Motor Car Co., The	3rd cover
Higgin Mfg. Co.	14
Hoopes Bro. & Darlington, Inc.	2nd cover
Hotel Latham	2
Jones & Co., Phineas	4-6
Keystone Paint & Filler Co.	4
Koller Co., J. B.	3rd cover
Masury & Son, John W.	2
Mayo Radiator Co.	4
Metropolitan Lamp Co.	18
McKinnon Dash Co.	4th cover
Mercer, Geo. J.	18
Moller & Schumann Co.	6
Moore & Co., Benjamin	4
National Association of Manufacturers	13
New Wapakoneta Wheel Co., The	1
Oliver Typewriter Co.	18
Payne Co., E. Scott	18
Porter, H. K.	14
Reilly, John, Inc.	2
Russell, Burdsall & Ward Bolt and Nut Co.	3rd cover
Standard Automatic Mfg. Co.	17
Standard Oil Cloth Co.	18
Standard Wheel Co.	16
Timken Roller Bearing Co.	1
Uebelmesser Co., Charles R.	12
United Rim Co.	3
Valentine & Company	6
West Tire Setter Co.	6
Wiggers Furniture Co.	4th cover
Wilcox Mfg. Co., D.	15
Wiley Co., C. A.	4
Woodman, Joel H.	18

Burlington Rubber Tire Machine

Our big No. 4 is the only machine made that will apply all kinds of solid and cushion rubber tires both internal and outside wires and close the joint on the same machine. One man can operate the machine easily without help. Put an end to your troubles in applying tires by investing in this machine. Write for descriptive circulars and price.

THE ENTERPRISE FOUNDRY
HARVEY, ILL., U. S. A.

Please mention "The Hub" when you write.

Which is more perilous
—farming or metal
working?

In occupational injury
where does the
average of fault lie?

What nation sets the
standard in
accident prevention?

On what day
of the week
do the
most accidents
occur?

How much
of the compensa-
tory
award
reaches the in-
jured workman?

What relief
system does
most
for indus-
trial efficiency?

Who are more
subject to
accident—
male or fe-
male workers?

Why are New
York accident
rates many
liability
times those
of Germany?

How can
American
liability
methods be
improved?

What are the
defects
of the English
system?

How can our
annual roll of
over
1,000,000
casualties be
reduced?

What propor-
tion of the
insurance
should the
employer bear?

What did
10,000 manu-
facturers
say of our
present liability
system?

AN EPOCH MARKING WORK!

ACCIDENT PREVENTION AND RELIEF

An investigation of the subject in Europe, with special attention to England and Germany, together with recommendations for action in the United States.

By **Ferd. C. Schwedeman** and **James A. Emery**
For the National Association of Manufacturers

BASIC facts underlying the whole subject of industrial accidents; the principles of accident prevention; equitable systems of compensatory awards, are embodied in this exhaustive analysis of industrial employments with regard to the safety of the individual, the conservation of human life and the welfare of the State.

A BOOK OF THE UTMOST VALUE

For the Employer, the Workman and the Legislator

CONTENTS

- | | |
|---|--|
| <p>Chapter I. Outline and Underlying Principles of European Compensation Legislation.</p> <p>Chapter II. Underlying Principles and General Working of the German Scheme of Compensation for Occupational Accidents.</p> <p>Chapter III. Detailed Description of Some of the Important Features of the German System—Efficiency, Prompt and Proper Medical Aid, the "Doctor Question," the Contributory Principle.</p> <p>Chapter IV. Obligatory Insurance An Important Factor in Accident Compensation—Various Forms of Insurance, Mutual Insurance, Statistics, Scientific Inspection, Litigation.</p> <p>Chapter V. Hazardous Occupations—Comparative Hazard of Industry and Farm.</p> <p>Chapter VI. Prevention of Accidents, Cause and Cure of Injuries, European Safety Museum (Accident Prevention Institutions).</p> <p>Chapter VII. Cost of Accident Compensation Insurance in Germany in Comparison with similar rates in the United States.</p> | <p>Chapter VIII. Employers' Liability in Great Britain Prior to the Compensation Acts.</p> <p>Chapter IX. The Introduction of the Compensation Principle by the Acts of 1897 and 1900, and the Investigation of the Operation of this Legislation by the Departmental Committee of 1904.</p> <p>Chapter X. The Final Extension of the Compensation Principle. The Act of 1906. Outline of Its Provisions and Examination of the Nature and Extent of Its Liabilities.</p> <p>Chapter XI. British Compensation Statistics. The Neglect to Record the Operation of the Earlier Acts Incompletely Remedied by Partial Information Required Concerning the Act of 1906.</p> <p>Chapter XII. Insurance under the Compensation Acts.</p> <p>Chapter XIII. Primal Defects of the British Legislation.</p> <p>Chapter XIV. Finding and Recommendations of the Committee.</p> |
|---|--|

APPENDIX.

Copiously illustrated with half tones, charts, and diagrams in color

Prices: Half Morocco [de luxe edition], \$15; Cloth \$10

ADDRESS

THE NATIONAL ASSOCIATION OF MANUFACTURERS
Terminal Building 30 CHURCH STREET, NEW YORK CITY


What is total disability
as applied to the injured
worker?

How can the "ambu-
lance chasing" practi-
tioner be eliminated?


The Higgin

LINE OF CARRIAGE TRIMMINGS

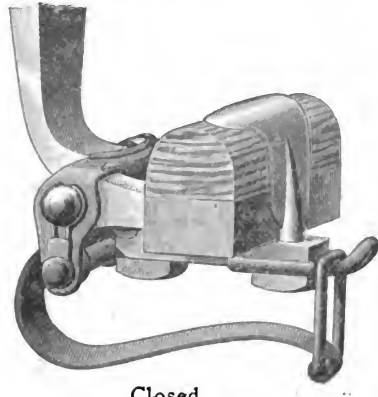
KNOBS



No. 70.




No. 133




Closed.
The Higgin Quick Shifter.




KNOBS



No. 72.



No. 130.

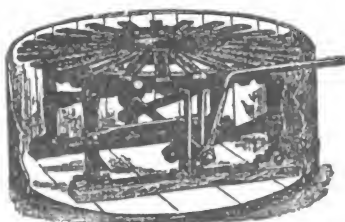
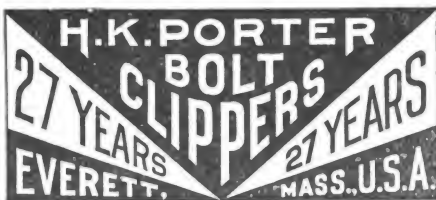




Full Leather No. 74. No. 13—Black Japan Nut

QUALITY UNSURPASSED.

Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co. Newport, Ky.



The Bokop Tire Setter and Cooler
Is the Best and Only Machine that has stood the test during the last 12 years on all classes of work, and is the Only Machine built with the Indestructible Wrought Iron Face Plate. Over 1,000 are in successful operation, repairs on which have not exceeded \$6.00 in the last 12 years. For prices, references and descriptive circulars, address **BOKOP, WEBB & PALM, Defiance, Ohio**

Please mention "The Hub" when you write.

Advertisements Classified

The following list includes advertisers in THE HUB. Each advertiser is entitled to name under one heading only. An extra charge for name under more than one heading.

Axles

American Ball Bearing Co., Cleveland, Ohio.
Keagy & Lear Machine Co., Coshocton, Ohio.
Timken Roller Bearing Co., Canton, Ohio.

Automobile Radiators

Mayo Radiator Co., New Haven, Conn.

Bodies, Seats, Etc.

Kilvington, S. W., Wilmington, Del.
Wiggers Furniture Co., The, Cincinnati, Ohio.
Woodman, Joel H., Hoboken, New Jersey.

Bolts and Nuts

Columbus Bolt Works, Columbus, Ohio.
Russell, Burdall & Ward Bolt and Nut Co., Port Chester, N. Y.

Carriage Forgings.

Columbus Bolt Works, Columbus, Ohio.
Eccles Co., Richard, Auburn, N. Y.
Indiana Forging Co., Indianapolis, Ind.

Carriage Hardware.

Gifford & Son, John A., New York.
Ochsner & Sons Co., A., New Haven, Conn.
Payne Co., E. Scott, Baltimore, Md.

Carriage Goods

Gifford & Son, John A., New York.
Higgin Mfg. Co., Newport, Ky.

Dashes, Fenders, Rails, Etc.

Bennett Mfg. Co., Alden, N.Y.
McKinnon Dash Co., Buffalo, N. Y.

Fifth Wheels

American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.
Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Finished Vehicles

Bailey & Co., Inc., S.R., Amesbury, Mass

Gear Irons

Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Gear Woods

Andrew Kimble, Zanesville, O.

Lamps

Gifford & Son, John A., New York.

Leather

Nelson, A. T. A., Co., Cincinnati, Ohio.
Reilly, John, Inc., Newark, N.J.

Lubricating Device

Aden Mfg. Co., Dansville, Va.

Motor Trucks

Gramm Motor Car Co., The Lima, Ohio.

Machinery and Tools

Bokop, Webb & Palm, Defiance, Ohio.
Enterprise Foundry, The, Harvey, Ill.
Porter, H. K., Everett, Mass.
Standard Automatic Mfg. Co., New York.
West Tire Setter Co., Rochester, N. Y.

Miscellaneous

Goshen Eyelet Co., Goshen, Ind.
Standard Oil Cloth Co., New York.
Uebelmesser Co., Charles R. Bayside, New York.

Rubber Tires

Consolidated Rubber Tire Co., New York City.
Goodrich Co., B. F., Akron, O.

Rims

United Rim Co., Akron, Ohio.

Shaft Couplings and Anti-Rattlers

Eccles Co., Richard, Auburn, N. Y.
Metal Stamping Co., New York City.

Steel Socket Shaft End Co., Cleveland, Ohio.

Spark Plugs

Ball Multi-Spark Plug Co., Minneapolis, Minn.

Springs and Gears.

Keystone Spring Works, Inc., Philadelphia, Pa.
Spring Perch Co., Bridgeport, Conn.

Varnishes, Paints and Japans

The Ault & Wiborg Co., Cincinnati, Ohio.
Devoe, F. W., and C. T. Raynolds Co., New York City.
Masury & Son, John W., New York and Chicago.
Moller & Schumann, Brooklyn, N. Y.
Murphy Varnish Co., Newark, N. J.
Valentine & Co., New York, Chicago, Boston, Paris.
Wiley Co., C. A., Hunter's Pt., New York City.

Wheels

Crane & MacMahon, New York
Gifford & Son, John A., New York.
Hoopes Bro. & Darlington, West Chester, Pa.
Jones & Co., Phineas, Newark, N. J.
New Wapakoneta Wheel Co., Wapakoneta, Ohio.
Standard Wheel Co., Terre Haute, Ind.

Wheel Stock, Bent Wood, Etc.

Crane & MacMahon, New York

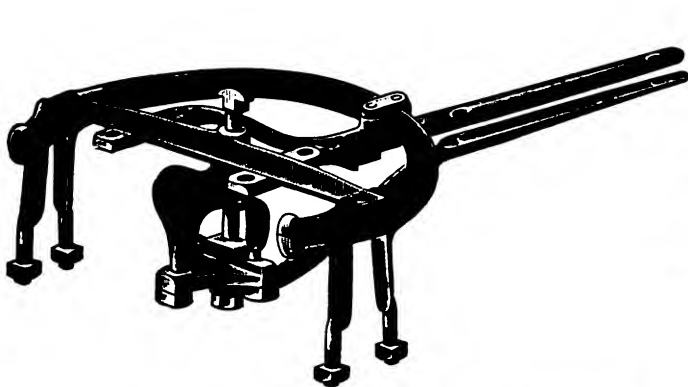
Richard Eccles Co., Auburn N. Y.

Manufacturers of

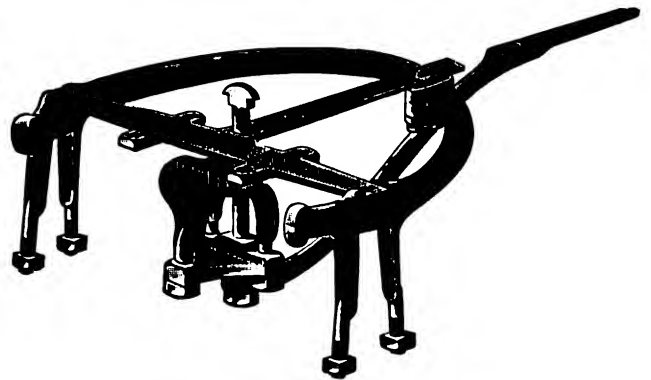
Forgings: Carriage, Wagon, Automobile, Special

Send for Catalogue.

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



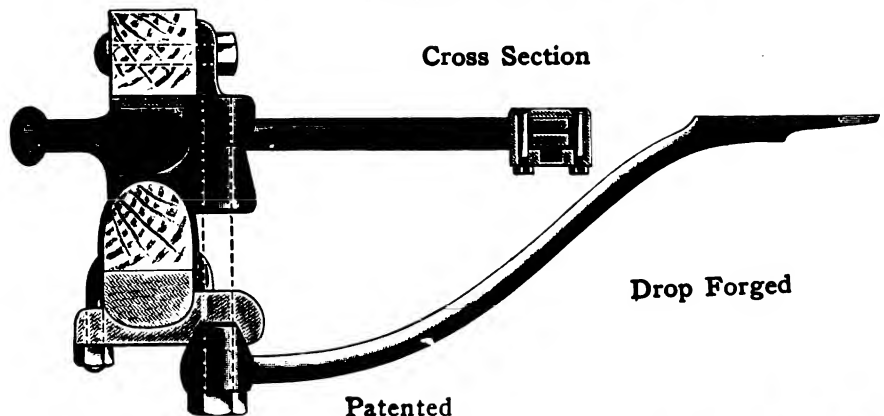
No. 1908—Gear Iron



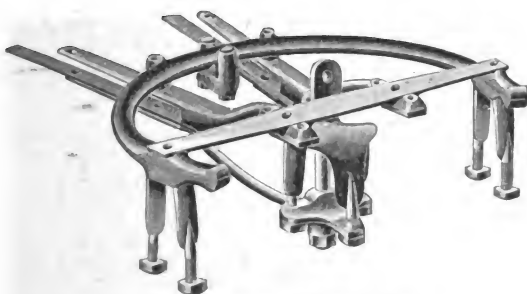
No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

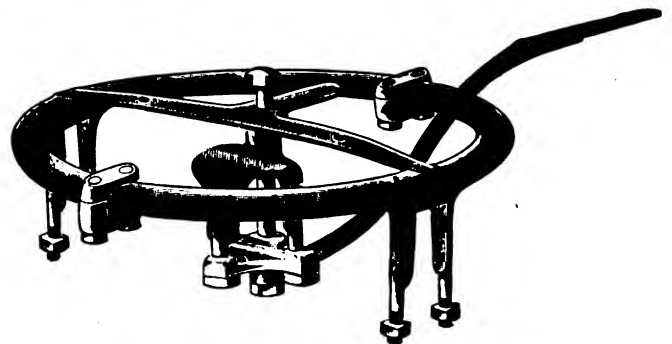
Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.



S
U
R
E
S
A
F
E



No. 1905—Gear Iron

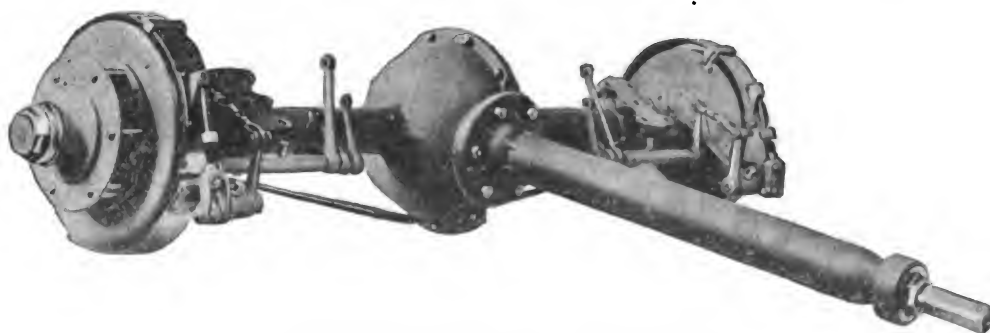


No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.



THREE-QUARTER FLOATING.
TYPE 14 FOR CARS WEIGHING UP TO 2800 LBS.
" 19 " " " " 2000 "

HOUSING IS STAMPED FROM SHEET STEEL, AND PROVIDES STRENGTH AT THE POINTS WHERE THE STRAIN IS THE GREATEST.

INTERNAL AND EXTERNAL BRAKES ARE 12" DIAMETER.

HUBS CAN BE EQUIPPED WITH ANNU-LAR OR ROLLER TYPE BEARINGS.

DRIVE SHAFT AND AXLE SHAFTS ARE MADE FROM ALLOY STEEL "HEAT TREATED SO AS TO GIVE THE HIGH-EST PHYSICAL PROPERTIES POSSIBLE.

DRIVING PINION FORGED FROM NICKEL STEEL DRIVING GEAR FORGED FROM CARBON STEEL. BOTH PINION AND GEAR ARE "HEAT TREATED." TEETH ARE PLANED.

THE DESIGN, MATERIAL AND WORKMANSHIP ON THESE AXLES ARE OF THE HIGHEST QUALITY.

Write us regarding your requirements.

THE AMERICAN BALL BEARING CO.

L. S. & M. S. RY. and EDGEWATER PARK

CLEVELAND, OHIO

Carriage Mechanics

Desiring to improve their present Condition should attend the

TECHNICAL SCHOOL

FOR

Carriage Draftsmen and Mechanics

SUPPORTED BY THE

Carriage Builders' National Ass'n.

The object of the School is to teach men to design vehicles and make working drawings, and to otherwise facilitate their work in the shop. Only those men employed in carriage or automobile building or their accessory trades are admitted to its privileges.

The classes are conducted in three divisions, viz.: Corresponding, Day, and Evening. The former is open during the entire year, while the day and evening classes are in session only from October 1st to April 1st.

The tuition is moderate.

For prospectus and full particulars, write to the instructor,

ANDREW F. JOHNSON,

18 West Forty-fourth St.,

NEW YORK CITY.

ESTABLISHED 1886.

Correspondence School of Carriage and Motor Carriage Drafting

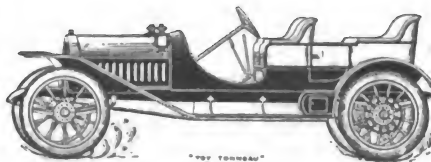
A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

Principal, THOS. MATTISON,

Hillside Avenue, Bitterne Park,
Southampton, England.

Author of "The Coach Body Makers' Guide," \$3.00; a practical treatise on "The Suspension of Carriages," "Bookkeeping," and other carriage building works.

George J. Mercer



AUTOMOBILE BODY
DESIGNER
and DRAFTSMAN

Body Makers' Working Drafts, Color Designs and Scale Drawings of Pleasure and Commercial Automobile Bodies.

Room 401

1777 Broadway, New York

Please mention "The Hub" when you write.

The Standard Automatic Brush

Does your painting work in a New Way—better, quicker, cheaper, eliminating all waste of paint. An equal flow at all times: thickness of coat can be accurately adjusted. Absolutely clean and fireproof

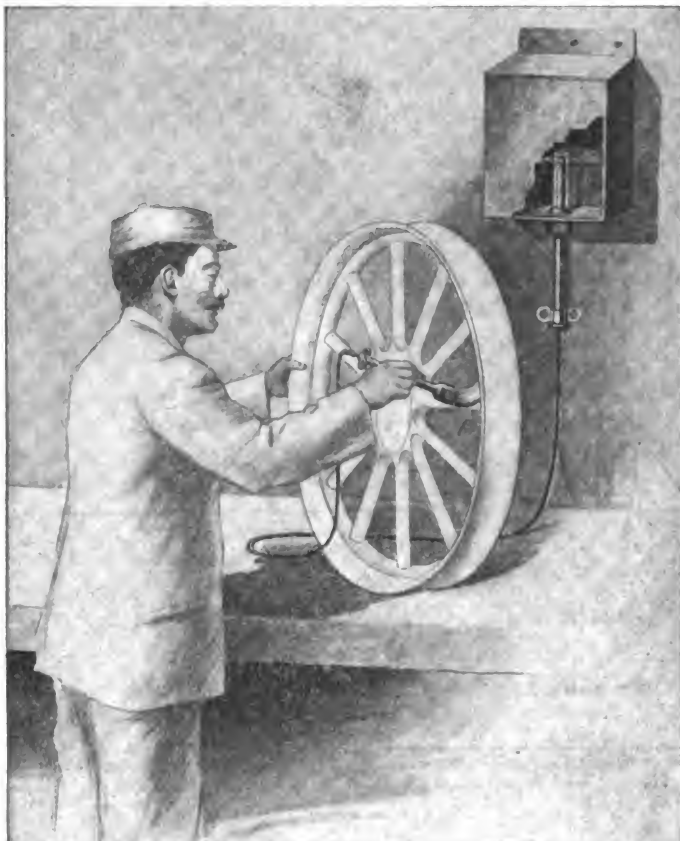
**Jobbers
and
Dealers
Wanted
Every-
where**

Complete Outfit

Consisting of a large paint tank, either stationary or movable, with automatic valve and six feet of flexible tubing, together with the automatic adjustable brush, made of aluminum,

Costs \$7.50

and it is still cheaper than the ordinary brush. The outfit is also made with a tank to be strapped on the back, which will cost \$2.50 extra.



The Standard Automatic System Does Away with the Paint Can

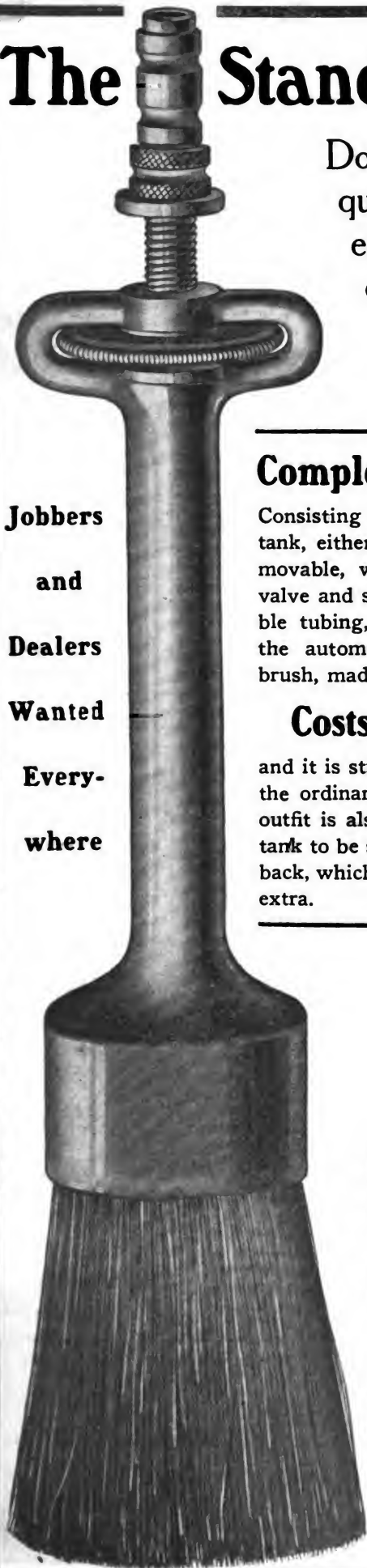
It eliminates the dip and is far superior to the spray, but it does rub it in. No air pressure is needed. Will work with any kind of paint. **GET NEXT TO THIS NEW METHOD.** Made especially for manufacturers of automobiles, automobile bodies and wheels, all kinds of vehicles, carriages, etc.

Wherever duplication of work exists, this device will increase your output and reduce the cost. Buy just one outfit to-day and be convinced. We are sure that we will have to equip your entire plant.

OUR LITTLE BOOKLET WILL TELL YOU WHY.

Write for one to-day. Send in your order. Your outlay will only be once. Apparatus will last a lifetime. Special equipments can be made to suit your purpose. Let us know what you are manufacturing and we will effect a saving for you.

Standard Automatic Mfg. Co.
50 CHURCH STREET, NEW YORK





MERITAS LEATHER CLOTH

MERITAS Leather Cloth is known to the trade as the leading low priced leather substitute.

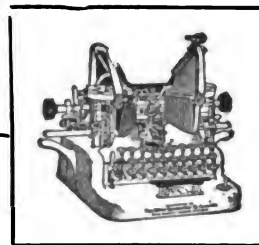
This is a much-improved product that you ought to see and buy for your pocketbook's sake.

Comes in muslin, duck and drill, dull and glazed, smooth and grained, black and colors for carriage and auto accessories trade.

At your jobbers.

Sample book on request.

Standard Oil Cloth Co.
320 Broadway NEW YORK



17 Cents a Day Buys The **OLIVER** Typewriter

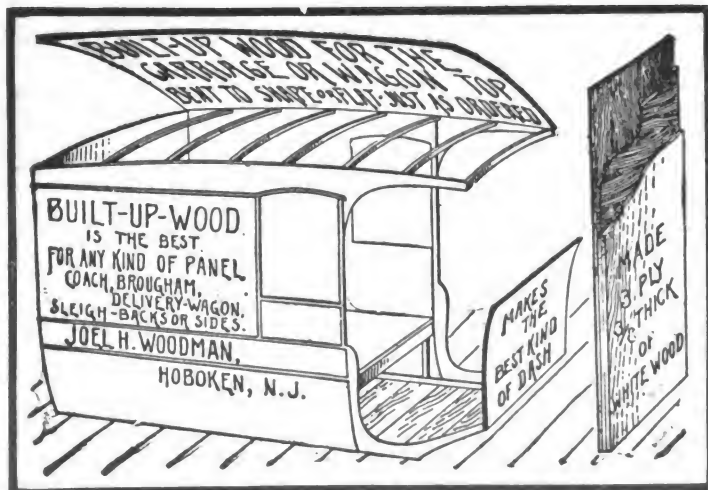
The Standard Visible Writer

Can you spend 17 cents a day to better advantage than in the purchase of this wonderful machine?

THE OLIVER TYPEWRITER CO.
310 Broadway, NEW YORK, N. Y.

E. SCOTT PAYNE CO.
OF BALTIMORE CITY
**CARRIAGE AND AUTOMOBILE
HARDWARE**
362 and 364 North Gay Street,
BALTIMORE, MD.

S. R. BAILEY & COMPANY, Inc.
Makers of the Celebrated.
WHALEBONE ROAD WAGON
AMESBURY, MASS.




Goshen Eyelet Co.
Manufacturers of
**Carriage
Top
Trimming's**
GOSHEN, INDIANA

H. WEICHHOLD

L. D. Phone 2290-W Market

METROPOLITAN LAMP COMPANY

Manufacturing and Repairing of

AUTOMOBILE SEARCH and SIDE LIGHTS, COACH and CARRIAGE LAMPS

Makers of All Kinds of Metal Goods.

Nickle and Silver Plating

24 Mechanic Street,

Newark, N. J.

Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

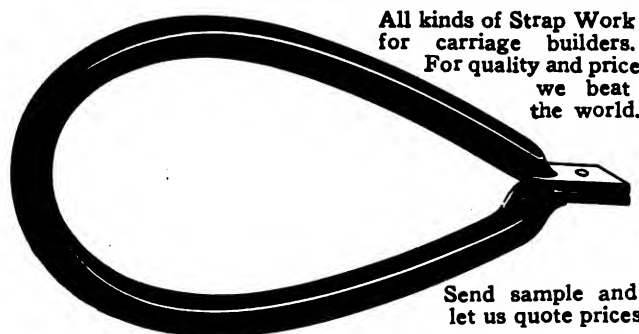
F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES



All kinds of Strap Work for carriage builders. For quality and price we beat the world.

Send sample and let us quote prices

J. C. DECKER :

Montgomery. Pa.

J. B. KOLLER & COMPANY

Manufacturers of

FINISHED SPOKES

All Sizes for

SARVAN, WARNER, SHELL BAND AND WOOD HUB WHEELS.

HICKORY and OAK BENT RIMS

Mechanicsburg,

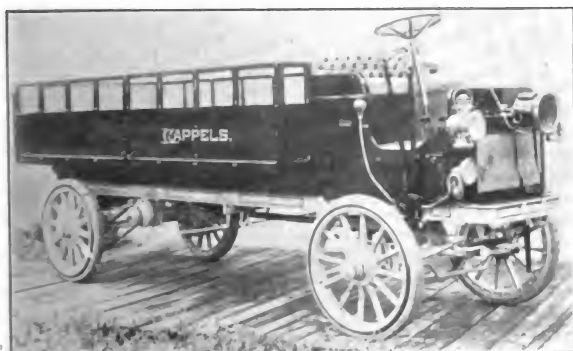
Pennsylvania



BOLTS Rivets, Carriage Makers' Washers and Burrs for all kinds of Vehicles
Russell, Burdsall & Ward Bolt and Nut Co.

Main Works, PORT CHESTER, N. Y.

Branch at Rock Falls, Ill.



The GRAMM Was a Success Before Other Commercial Cars Came Into Existence

Ask any well posted man to tell you what commercial cars were prominent when the really great American pleasure cars were first making history.

"Well," he will say, "there was the Gramm —"

And there he will stop. He knows the Gramm because a decade ago B. A. Gramm had marked out the way for other successful trucks to follow. The Gramm was a notable, practical achievement long before competing commercial cars came into being.

Those years of extraordinary experience are the Gramm's greatest asset; no truck buyer can close his

eyes to the fact that other trucks must pass slowly through the same trying period of development.

Wherever the Gramm has entered into a contest with other trucks, the value of that long experience in truck building was made clear.

The Gramm has not only made repeated perfect road and technical scores when handicapped with overloads, but IT WAS ALWAYS READY TO REPEAT ITS SUPERB PERFORMANCE.

In addition to the Gramm's efficiency, its marvelous records in economy tests offer the most powerful appeal possible to the shrewd truck buyer.

You must inevitably judge all other motor trucks by the Gramm.

THE GRAMM MOTOR CAR CO.,

107 South Lima Street, Lima, Ohio, U. S. A.

New York Headquarters: CROSS-MAGILL MOTOR TRUCK CO., 30 Church St., New York City. Let us send you our monthly "Gramm."

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



No. 332-B with Brass Rail.

A DASH RAIL

is as important a part of a dash as a

ROOF IS, OF A HOUSE

The Rail Protects the Top of the Dash

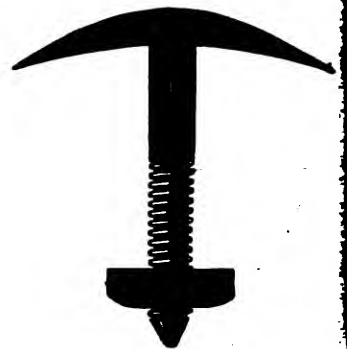
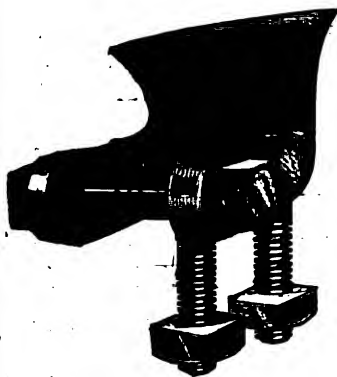
Skewed Shaft Couplings

Regular or Oval Patterns
For High Arched Axles

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{3}{8}$ or $\frac{1}{2}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



A. H. WIGGERS
Pres. and Mgr.

H. H. WIGGERS
Sec'y and Treas.

E. S. WIGGERS
Vice-Pres.

WIGGERS' BODIES

Automobile - Carriage

MERIT CONSIDERATION



Just One of Many Styles.

Because { THEY HAVE { Style
 { AND ARE { Quality
 { Symmetrical Outlines
 { Well Seasoned
 { Made to Wear
 { Priced Right

Address

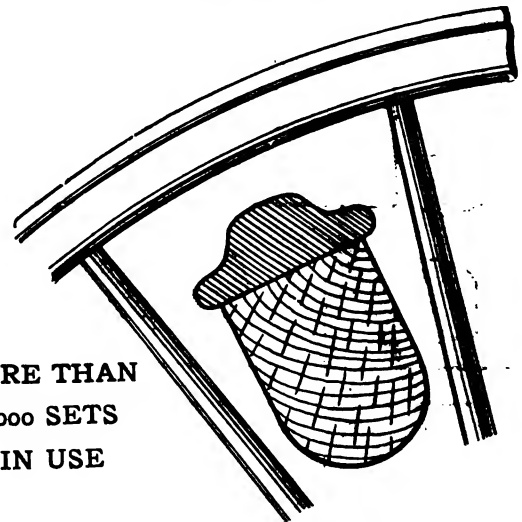
The Wiggers Furniture Co.

Manufacturers of Carriage
and Auto Bodies and Seats

417 to 1423 Plum St.

Cincinnati, Ohio

THE BARBOUR (NEAR) RUBBER STEEL TIRES



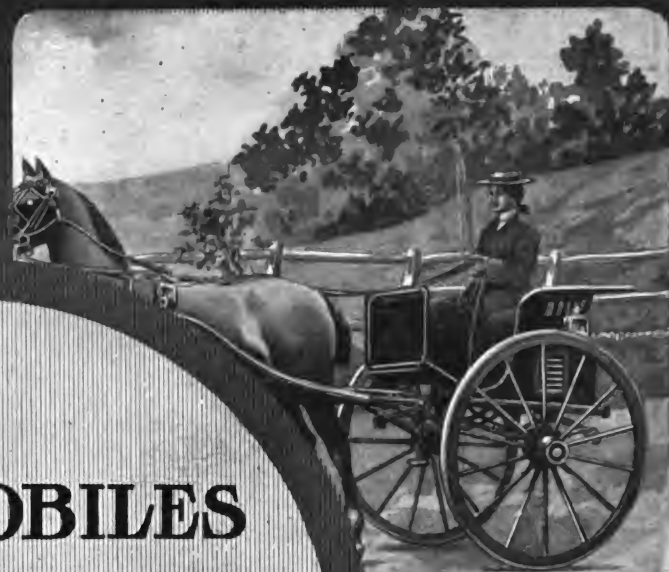
MORE THAN
10,000 SETS
IN USE

They wear fifty per cent longer than the flat, and add from fifty to one hundred per cent to the life of a wheel. Having no suction are of lighter draft in mud. Ride easier than other tires. Strike obstructions glancing instead of solid blows. Have more resistance to expansion and elongation. Cast loose stones aside instead of passing over them. Strengthens felloe between spokes. Add greatly to the appearance of a vehicle. Are moderate in price. Sold by leading jobbers. For further information write

BARBOUR STEEL TIRE CO.

TERRE HAUTE, IND.

The Hub



**AUTOMOBILES
CARRIAGES
MOTOR TRUCKS
WAGONS**



TRADE NEWS PUBLISHING CO
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN
STAR or KENNY
Sweet Concealed Band
WOOD HUB
WARNER

WHEELS

HEAVY and LIGHT
for
CARRIAGES
WAGONS and
TRUCKS

IF YOU WANT THE BEST TRY OURS



Load—Ten Tons of Coal.

SOLVED! Is the way motor car experts express themselves on the subject of tires for commercial motor vehicles after seeing and using the

KELLY-SPRINGFIELD SECTIONAL TIRE

With a grip on the road that means progress and security from the fault of solid tires—that of crowding the rubber ahead under load, which means disintegration—the motor wagon and truck owner will find in the Kelly-Springfield Sectional Tire the best tire for all heavy cars. Each section is dependent upon itself. If interested, write

CONSOLIDATED RUBBER TIRE COMPANY

New York, N. Y., and Akron, Ohio

Branches: Boston, Chicago, Philadelphia, St. Louis, Detroit, Cincinnati, San Francisco.



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT,  ACORN,  and STAR  BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO. RICHMOND, VA.

For Export Prices apply to the New York Office.



**2 horses
can do
the work of 4**

Timken Roller Bearing Axles

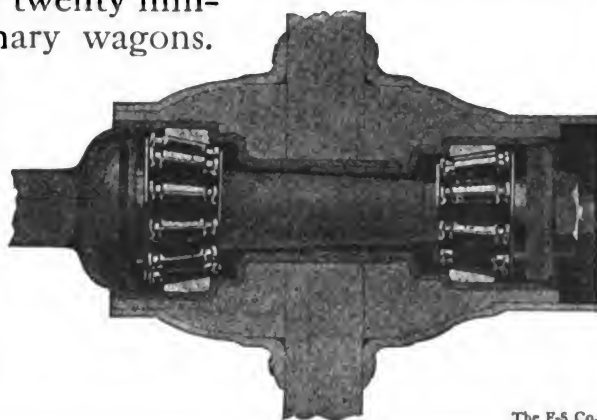
Reduce draft **50%**, thereby enabling the wagon owner to make one horse do the work of two, or two do the work of four horses in an ordinary wagon.

Timken Roller Bearing Axles cut feed, shoeing and harness bills in two. They require oiling only once a month or so, thus doing away with the dirty and disagreeable twice-a-week, fifteen or twenty minute job of greasing necessary on ordinary wagons.

Every wagon you sell with *Timken Roller Bearing Axles* sells another. And there is a larger profit on a wagon with *Timken Roller Bearing Axles*.

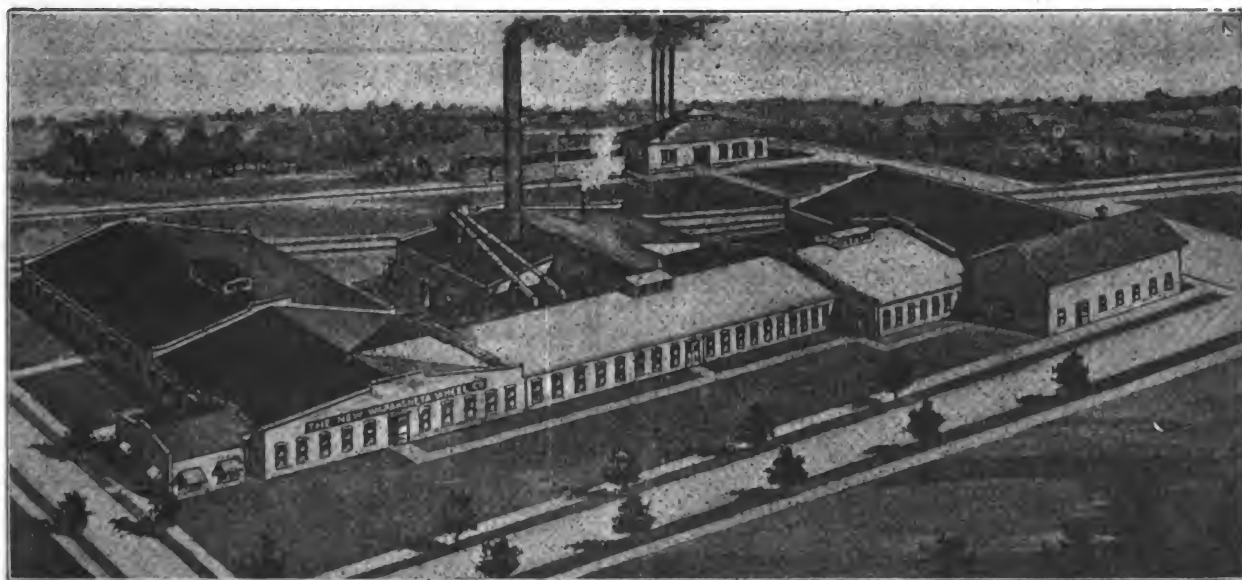
If you want **FACTS AND FIGURES** write today
—before some other wagon builder gets ahead of
you—and get **CATALOGUE and PRICE LISTS**.

The Timken Roller Bearing Company
CANTON, OHIO



The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Please mention "The Hub" when you write.

JOHN W. MASURY & SON

Superfine Coach and Automobile Colors

AND MANUFACTURERS OF
Fine Carriage and Automobile Varnishes

New York, Chicago, Minneapolis, Kansas City

HOTEL LATHAM

5TH AV. AND 28TH ST.

NEW YORK

For Permanent and Transient Guests

One block from Madison Square Garden

EUROPEAN PLAN

Sample rooms for commercial men

Table d'Hote Luncheon, 50c

CLUB BREAKFAST, ALSO A LA CARTE

ROOMS WITH USE OF BATH, \$1.50 PER DAY

ROOMS WITH BATH, \$2. \$2.50 \$3. \$4. PER DAY

A. L. PRATT
MANAGING DIRECTOR

JOHN REILLY Inc.

Established 1865

MANUFACTURERS OF ALL GRADES OF

LEATHER

FOR THE

Carriage & Automobile Trade

PARTICULAR ATTENTION CALLED TO

OUR AUTO SPECIAL

FACTORIES,

Avenues C & D, Murray & Astor Streets.
NEWARK, N. J.

AGENTS,

Cincinnati—National Hardware Co., Fourth Street
Detroit—C. W. Findlater, No. 313 Forest Ave., West

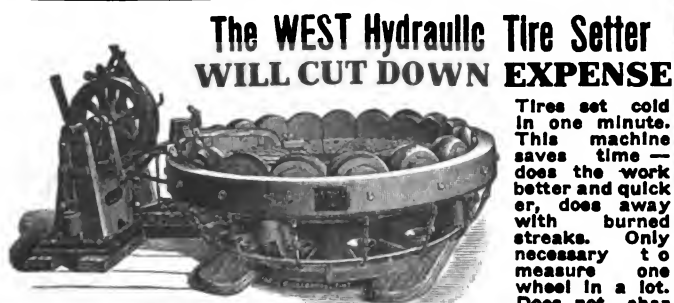
Please mention "The Hub" when you write.

MOLLER & SCHUMANN COMPANY

Most perfect as to working, drying and wearing.

Send for color card and descriptive price list.

Chicago Branch - 110 N. Desplaines St., Office and Factory - BROOKLYN, N. Y.



**The WEST Hydraulic Tire Setter
WILL CUT DOWN EXPENSE**

Tires set cold in one minute. This machine saves time — does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim and

thus make the tire loosen prematurely. Saves re-sandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO., ROCHESTER, NEW YORK

Jones Wheels

BEST ON EARTH

KANTSAMORE

**Phineas Jones & Co.
Newark, N. J.**



They are small but they make
a pretty good little library on

AUTOMOBILE PAINTING

They describe several systems of finishing, including

They also tell all about **Valentine Vanadium
Varnishes** — a full line for Automobiles.

You can use them in your business

Fill in coupon and booklet shall be sent to you at once.

VALENTINE & COMPANY, 257 Broadway, New York

Name
Address
Town
State
Cut out & mail to
Valentine &
Comp'y

Please mention "The Hub" when you write.



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

¶ Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
New Haven, Connecticut

WILLEY'S COLORS

The **RECOGNIZED STANDARD**



C. A. WILLEY CO.
COLORS GRINDERS

and Manufacturers of Specialties in

**CARRIAGE, AUTOMOBILE AND CAR
PAINTS**

COLORS, VARNISHES, ETC.

HUNTER'S POINT, NEW YORK CITY

Headquarters for "The H. D. Smith & Co.'s" Carriage and Wagon Forgings

JACOB GERHAB

Dealer in

**Carriage Cloths, Leathers and Trim-
mings, Wagon and Cart Material**

Salable prices and all information cheerfully furnished.

158, 160, 162 and 164 North Third Street.
PHILADELPHIA, PA.

ESTABLISHED 1855

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

AUTOMOBILE WHEELS

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply any style demountable or detachable rim or tire.

THE SURPRISE IS YOURS

When You Open Your First Can of

MOORE VARNISH

Easy Working Perfect Flowing Long Lived
Highest Quality Under Every Label

BENJAMIN MOORE & COMPANY
Varnish Makers

New York Chicago Cleveland Toronto

KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

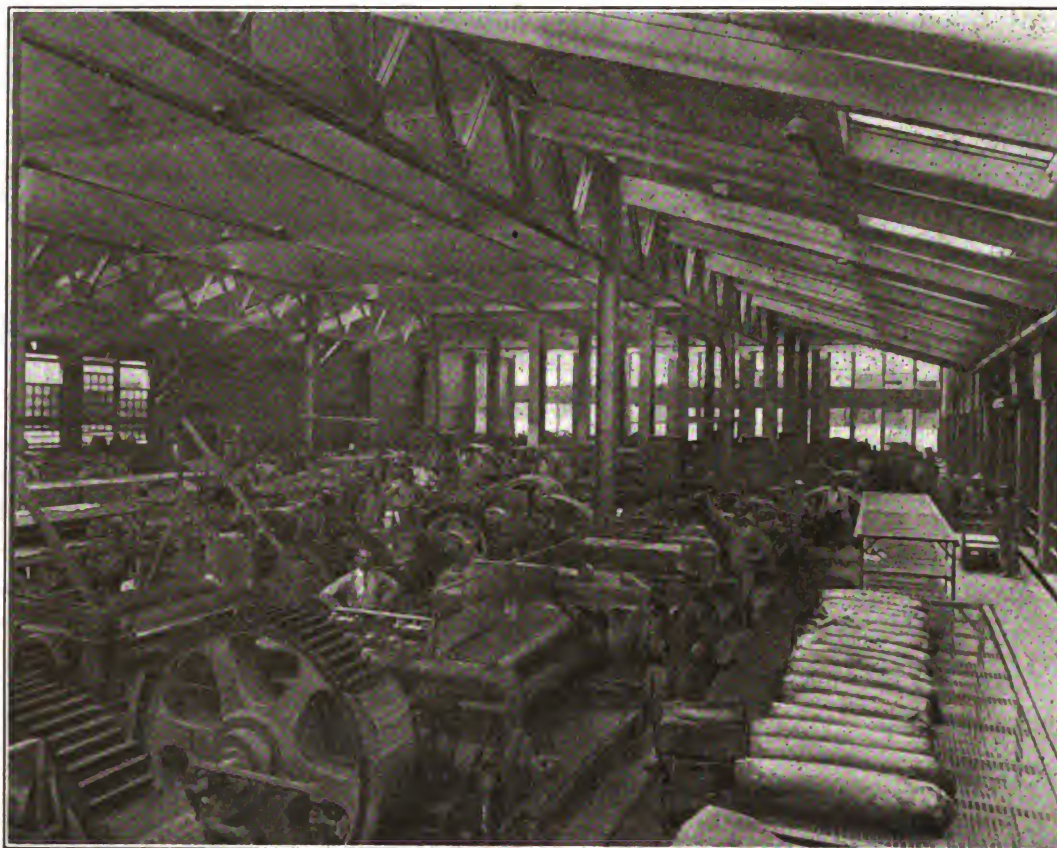
It fills the pores of Metal and Wood perfectly. Sand-papers easily and produces a fine smooth surface that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

GOODRICH "SERVICE"

The Mill Room



Here the rubber is rolled or milled to give it proper consistency. This is the next step after the cleaning and drying of the crude. In other words, this picture shows the manufacture of rubber. Further on, the rubber is patterned into articles of sale, and cured.

This Department, representative of the equipment of the plant of the B. F. Goodrich Company, is the largest and most completely equipped Mill Room in the world.

The B. F. Goodrich Company

Akron, Ohio.

We Offer In

The Ideal Paint Vehicle

PROTEKTOL is the result of careful study and scientific research for a carrier to produce a perfect paint film.

Paints made with PROTEKTOL as the vehicle, look better, wear better and last longer than any other paints now produced. They flow perfectly and dry to a smooth, elastic film, free from the pores so objectionable in linseed oil paints.

The inherent drying property of PROTEKTOL obviates the necessity of adding driers for outside work.

Convince yourself of the merits of PROTEKTOL by giving it a practical trial.

The use of PROTEKTOL means Perfect Paints as well as money in your pocket.

Write to-day for descriptive pamphlet.

Branches:

New York, Philadelphia

Buffalo, Toronto

Montreal, Buenos Aires

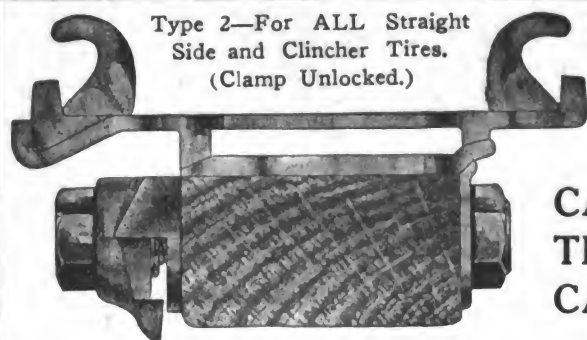
THE AULT & WIBORG CO.
VARNISH WORKS
CINCINNATI.

Branches:

Chicago, St. Louis.

Minneapolis, San Francisco

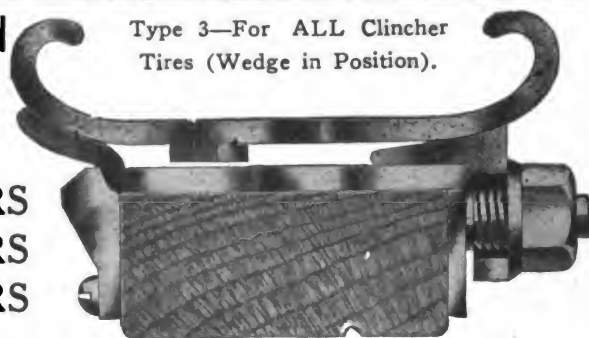
Mexico City, London, Eng.



Type 2—For ALL Straight
Side and Clincher Tires.
(Clamp Unlocked.)

**STANDARDIZATION
OF RIMS THAT
BENEFITS**

**CAR BUILDERS
TIRE MAKERS
CAR OWNERS**



Type 3—For ALL Clincher
Tires (Wedge in Position).

The Standard Universal Quick-Detachable Demountable Rims

"FIT ALL TIRES" and SOLVE THE PROBLEM OF INTERCHANGEABILITY

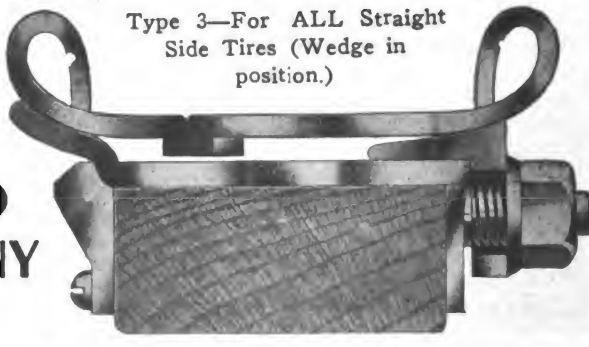
25,000 Sets of Demountable Rims and 135,000 Sets of Quick Detachable Rims; practically 96% of the total number of Rims made in the United States, have been contracted for by 100 leading manufacturers.



Type 1—For ALL Straight
Side and Clincher Tires.
(Clamp locked.)

Write for illustrated
descriptive matter.

**THE UNITED
RIM COMPANY**
AKRON, OHIO



Type 3—For ALL Straight
Side Tires (Wedge in
position.)

Please mention "The Hub" when you write.

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President.

G. A. TANNER, Secretary and Treasurer.

24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00

AMERICAN HARNESS AND SADDLERY

DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Mieser, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Good Convention Prospects.

The horse vehicle builders have had, and are having, a business comparable to a boom year almost.

Those who have felt called upon to formulate the reasons have put forth various opinions. The one most common seems to be that the concentration of the business has made the survivors the busy people they seem to be.

This is an occasion where the reason for it is not so important as the fact itself.

The country is so big, and its needs so diversified, that it is just out of the question to confine vehicular traffic to any one dominant type of vehicle or method of propulsion.

The fact that the trade is busy is contentment enough. We are only prone to see minutely for causes and explanations when matters are not to our liking.

We have observed that when affairs fatten the bank account that vehicle builders are keen to get together, talk it over, and prepare for "more of the same."

The conventions of the trade have always offered the best rallying point, and we conclude from this that the

forthcoming convention in Atlantic City in September will be one that will leave its mark as a record.

The arrangements are very complete, and the surroundings delightful, especially in the latter part of September. The very low railroad rate lasting over a great length of time, that has been so successfully established season after season, makes the journey even more attractive, financially, that a special rate that would be granted the association, so there will be no hesitancy on that score. We expect to see an unusual family attendance, even, as the ladies will not forego such a chance.

It is not too early for intending exhibitors to think about space. There will not be any more than enough, it is our judgment. The plan of securing it put into effect by the secretary makes the early applicant a holder of preferred position, so it is well to emulate the early bird. We believe there is good business in sight for the accessory manufacturers.

The Trust Decision.

It seems to be general opinion that the trust bogie is laid. There is a "beneficial trust" by law now. The wicked trust that is actually a harmful monopoly, is said to be confronted with law enough to send it on the path to dissolution.

Some say the Sherman Law now "has teeth in it." Some say that "crime is personal." The published "sayings" of alleged important men are to the effect that the decision will be like a tonic to business.

The one clear fact that may be discerned by all is that the Standard Oil Co., of New Jersey, must become non-existent. The other clear fact is that no one supposed to have been naughty has been sent to jail.

The decision has not had the disorganizing effect on business that some feared it might have. Business in whatever form may continue if it wills, but it can't combine to such an extent as to make a monopoly of the transaction. This leaves the status of thousands of corporations where it was.

One fact is clear; business has an authorized chart to go by that it did not have. The conditions of the battle between competition and combination are somewhat altered, but the battle will proceed, as usual, we suppose.

Slow Automobile Trade.

The sale of new cars is not flourishing, and the disposal of second-hand material is not feverish.

The number of licenses dropped this season is formidable. Repositories in which new work is displayed

must be experiencing lotus-eating times. Salesmen must feel they are in that land where it is "always afternoon."

If this decided let-up should cause the builders to take a thinking spell, and to study how the car could be simplified, and make very much less noise-creating, oil-spilling, smell-distributing cars, it would mark a firm step forward, and be a very fine thing to observe.

The promotion of the industry, up to now, has been so "easy," that makers have not had time, no doubt, to do much else than make money first, and cars incidentally to the money-making. A time of stress, or let-up, should be a fine time to do a little thinking, and we feel that it will be time put to producing cars that will be distinct advances on those now for sale.

There is room for so very much improvement and it takes "hard times" competition to develop such results.

Delivery Work.

In New York there may be noticed a slow but seemingly steady increase in the use of commercial motors. Probably at other points the same is true, possibly in larger degree. The conservative inertia in this locality is a dense factor to overcome.

So far we have noted nothing in the movement that is convincing. The class of the business using the trucks and delivery wagons is the kind that would be enchanted with a new idea for the sake of its publicity; and expense would not be a controlling thought. If the work done by these wagons should be of the right missionary kind, it will prove an entering wedge that will greatly widen the breach. It will take some time for this to be demonstrated. It will be interesting to learn the cost of the experiment, and that cost will be forthcoming in time it is fair to presume.

As with the public hacks, so with these wagons. We seem to notice a different class of operator. The men are younger, and of another type than the driver of horses. They look as if they would demand more wages for the service rendered. That is another problem that will have to be met.

If we are in an evolutionary stage the unfoldment is very slow hereabouts.

Working Iron.

We talk about iron and steel to-day in scientific phrases. More is being done with what used to be regarded as refractory ores. More kinds of crude iron are being worked up. But there is an observation of old-timers that seems sensible. It is that the more refractory the ore is, the poorer the resulting iron is likely to be.

Stubborn ores require a lot of heat to get them fluid enough to run off the contained impurities. These high temperatures probably are very hurtful to the grain and tensile strength. The product is likely to be short and brittle.

In the carriage trade Norway charcoal iron was always held in high repute for its toughness and strength. It was made by lower heats and slower processes than are now

demanding. It would be impossible to reduce some of the ore of to-day by hot blast charcoal furnaces of other days.

And we believe the quality of the iron product for many purposes is not so good.

It used to require plenty of time to manipulate the crude material. Nobody would pay the price for the time to-day. Is the iron as good for many purposes? We think not.

Combination Transmission.

When the idea first appeared as practically applied we illustrated the combination gasoline-electric transmission.

For commercial work this seemed to us to be very desirable, and it looked practical. It easily solved the problem of the driver who might be careless, or who did not understand machinery.

But somehow, as great progress as might have been expected did not materialize. In other countries, we are informed, quite flattering headway has been made.

We presume that the several systems that have shown themselves in operation here, are being more fully developed, and probably newer ones are being experimented with.

There may be more complication in the system than appears on the surface, and there may be an excess of weight to overcome, but it ought to prove a fine field for the ingenious, as a successful device would satisfactorily answer a lot of questions.

Artificial Rubber.

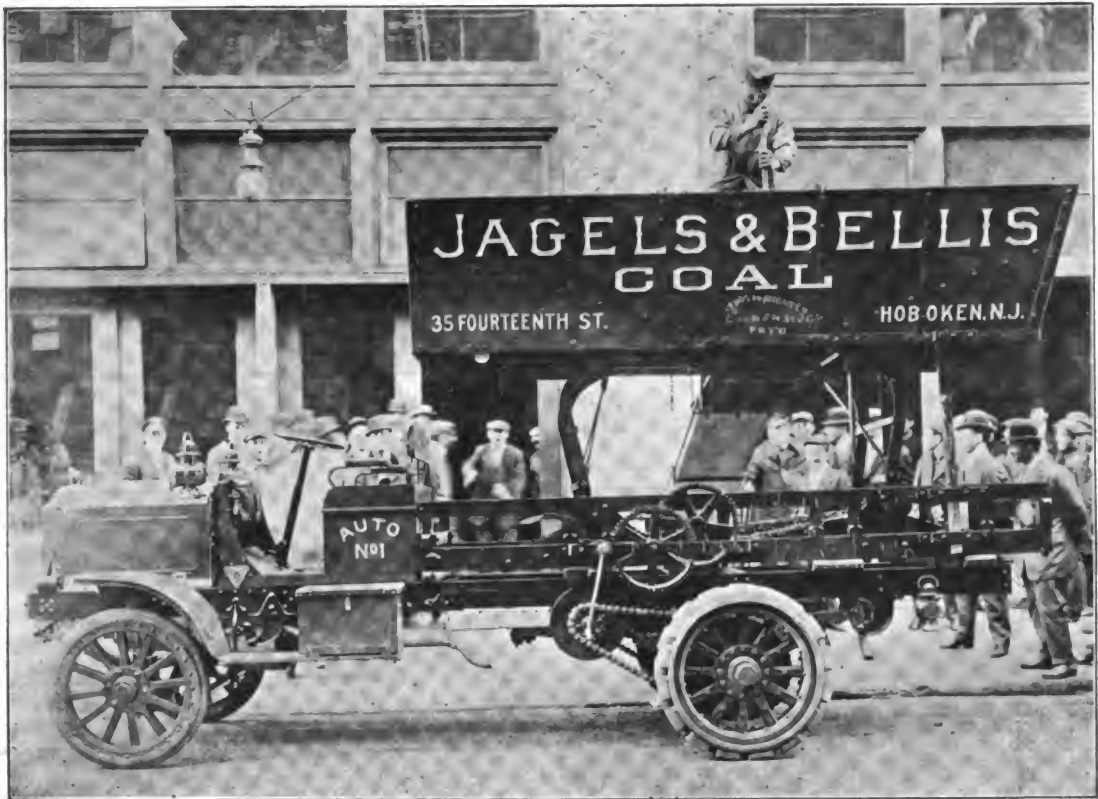
Although the planting and production of rubber has had almost a world-wide stimulus, and the supplies in the near future promise bountiful supplies, yet the chemists do not relax their effort to create synthetic rubber. The latest is the patent of two industrious Germans, who, using the oil of the Soya bean as the medium, have patented a process that is claimed as a satisfying success.

AN IDEAL EXPORT LETTER.

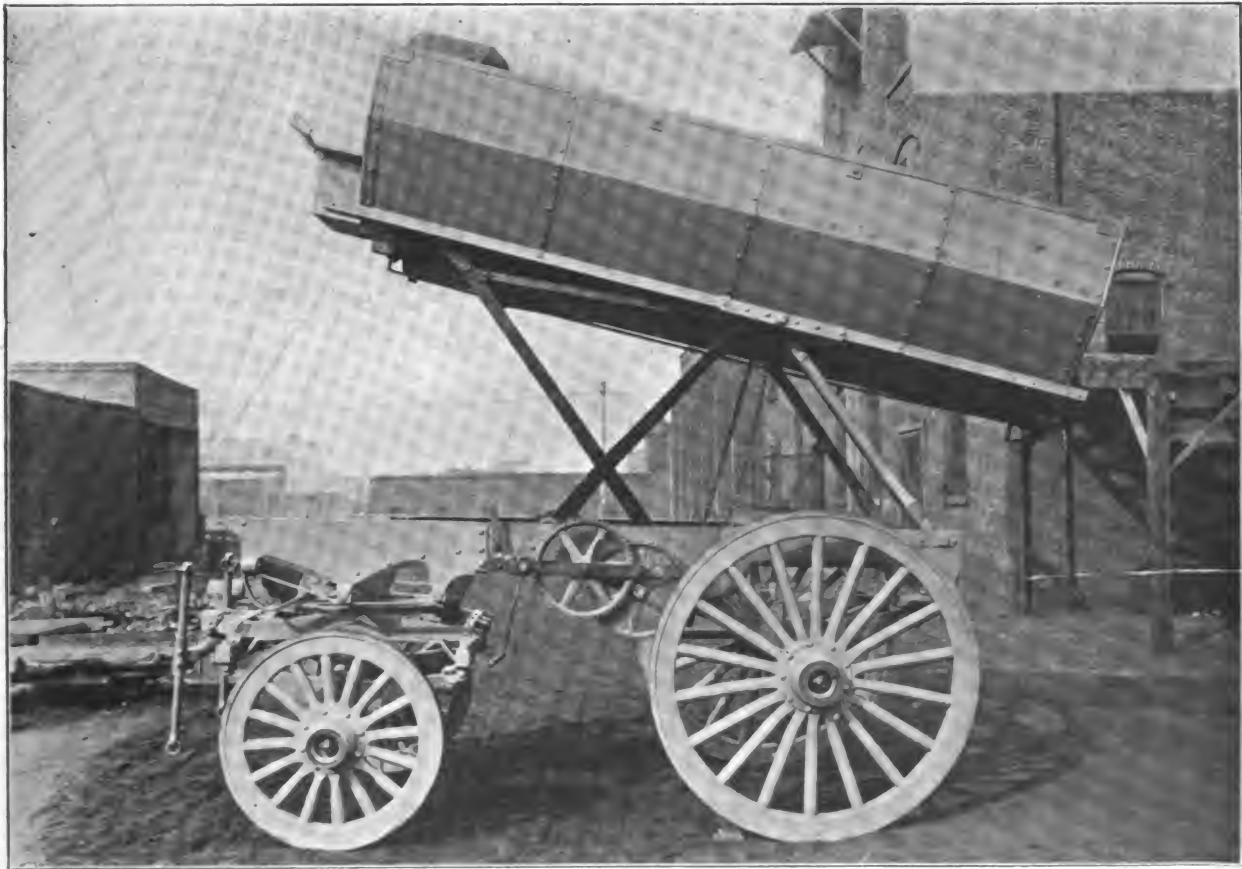
The following extract from a letter received at the office of Consul Frederic W. Goding, Montevideo, Uruguay, from a well known and successful American manufacturing company, shows that the company desires to enter this commercial market and is bound to succeed:

"If you can recommend to us any concern handling * * * our supplied in your country who could act as our agents we would be glad to communicate with them to the end that we may induce them to do so, and, providing that they furnish satisfactory references, we will supply them with a number of various standard sizes on consignment to carry in stock for immediate delivery, they to pay for the goods only as they sell them and we to keep the stock replenished as fast as it is depleted. We are prepared to quote very attractive export prices which will compete favorably with Scotland and Germany, and we will also prepay the freight. In fact, we are prepared to do anything reasonable to get the business. We have * * * been in business for over thirty years, and our * * * has been such a success that we are determined to push the trade farther."

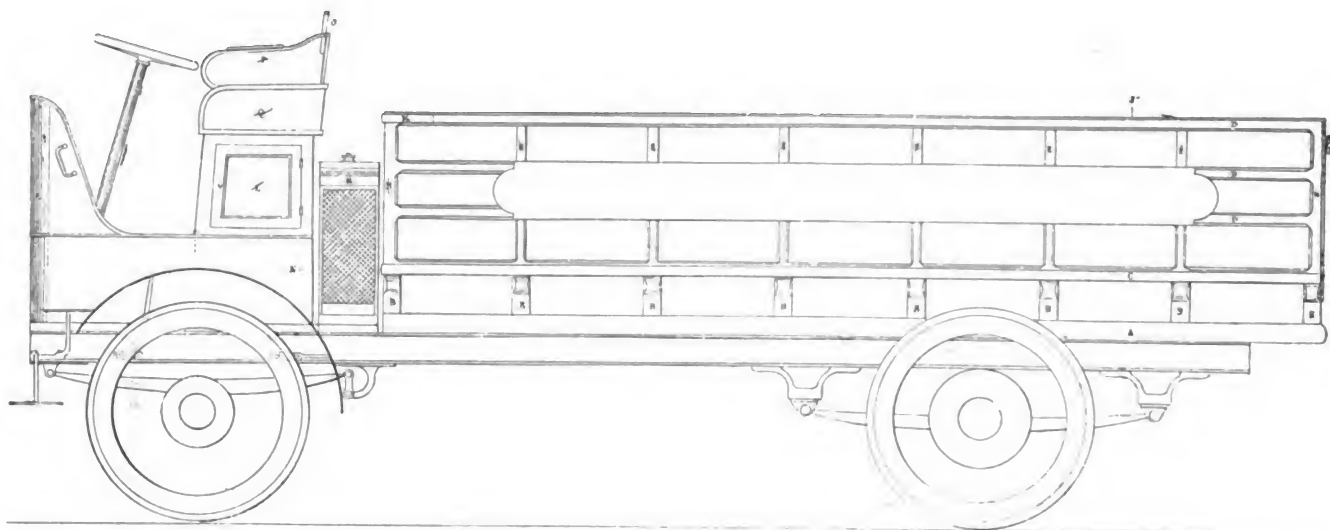
If other American houses were as anxious to get into this South American trade, and would offer similar inducements, a vast amount of this business would soon go to the United States.



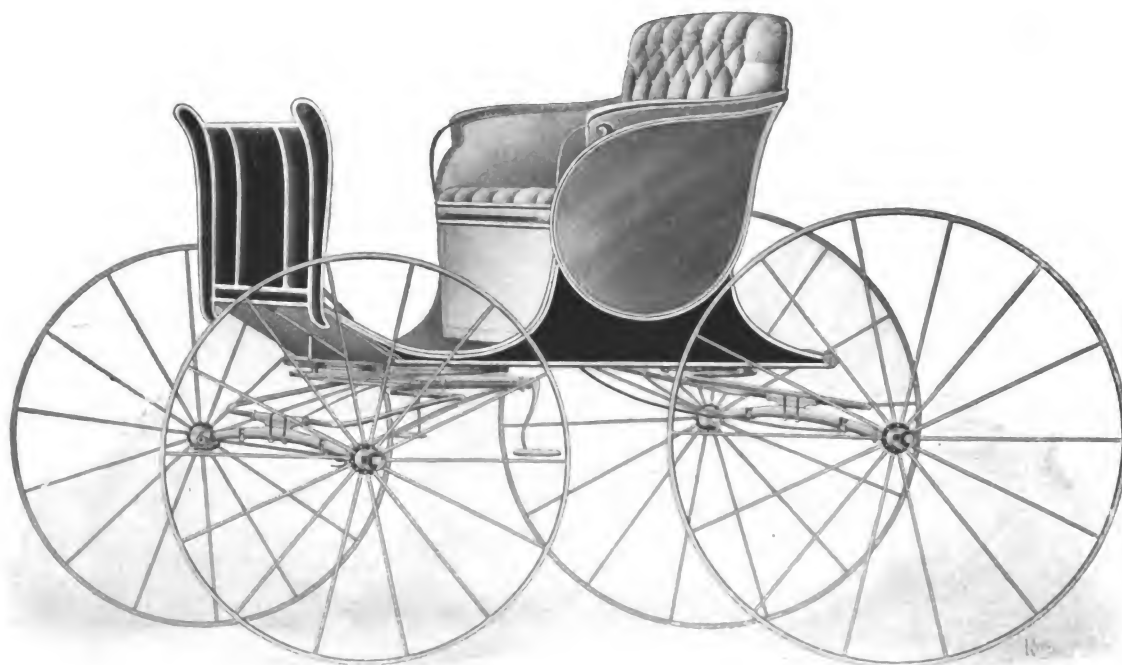
THREE-TON CHASSIS COAL DUMPING TRUCK.



COAL DUMPING WAGON.
Built by Joseph Wright, Jersey City, N. J.

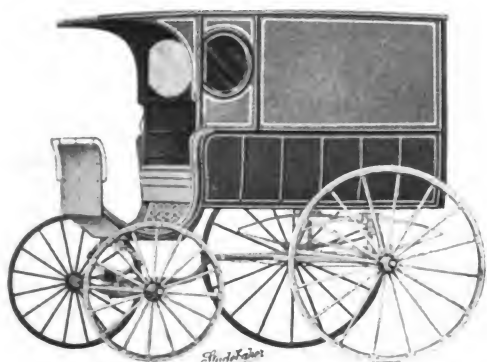


RECENT FRENCH COMMERCIAL TRUCK BODY.



SHERIDAN'S PATENT SHORT-TURN SAFETY GEAR.
Built by Enterprise Carriage Works.

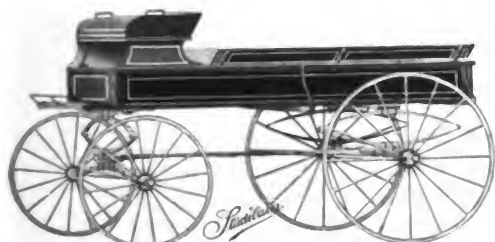
A GROUP OF QUALITY STUDEBAKER WAGONS



7101—Phaeton Front Panel Side Fancy Delivery Wagon.



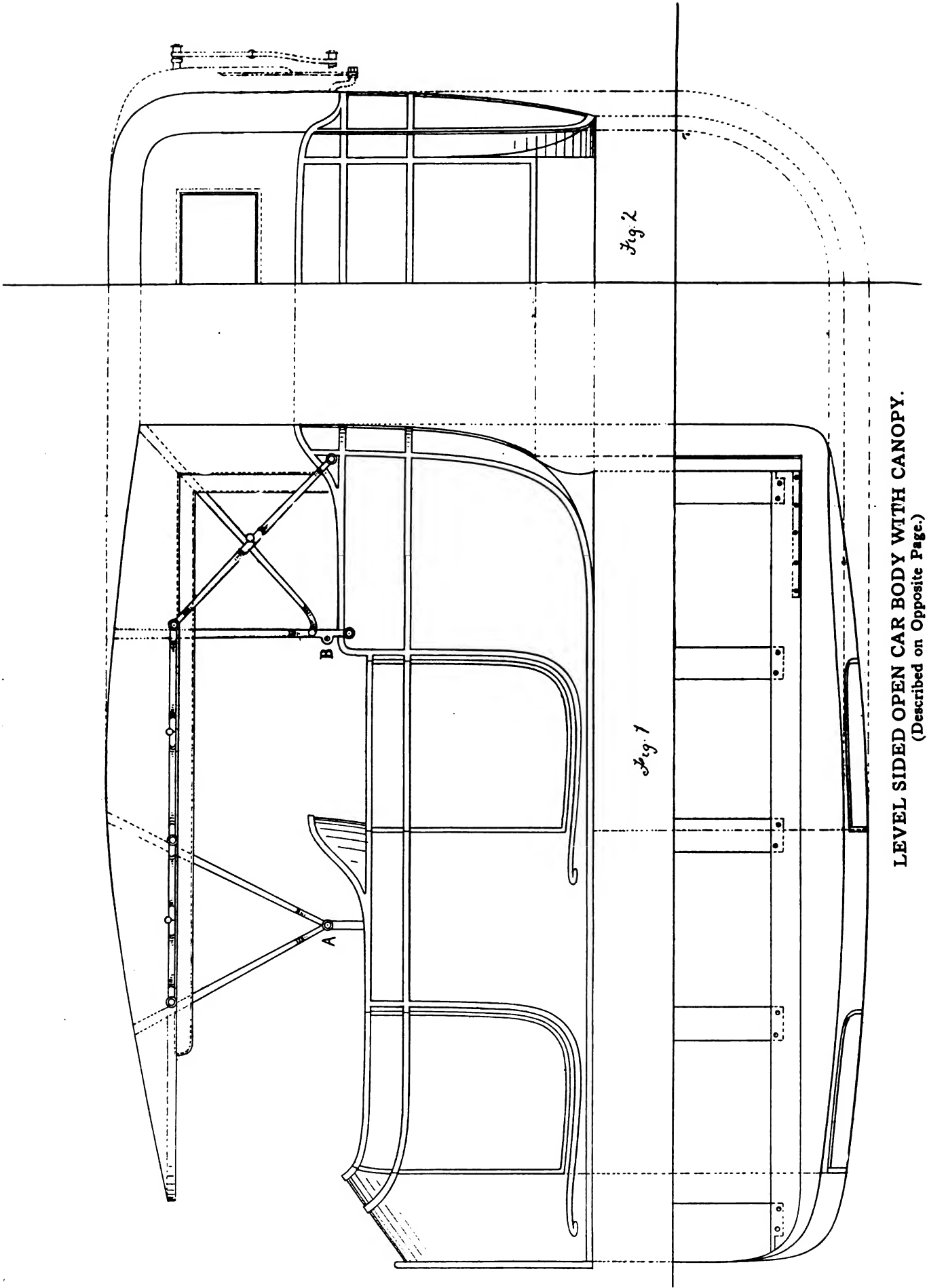
7400—Low Down Short Turn Panel Side Milk or Baker's Wagon.



6815—Three Spring Cut-under Delivery Wagon.



6706—Three Spring Short Turn Low Down Panel Side Wagon.



LEVEL SIDED OPEN CAR BODY WITH CANOPY.
(Described on Opposite Page.)

Wood-working and Smithing

LEVEL-SIDED OPEN CAR BODY WITH CANOPY

(Illustrated on Opposite Page.)

In public favor the level-sided open car with canopy holds a strong place. It is a style of body that shuts off a relieving surface in the cutting up of the quarters, making it difficult to get at the formation of graceful lines.

This style of body has the advantage of giving comfort both in its seating provisions, and in protection from wind. In designing a car body, these points are of the first importance; grace of outline and elegance in composition must always be secondary to utility. But the strength of art lines should constantly be present in the draughtsman's brain, because it is this element that gives commercial life to the products of every carriage and motor car manufacturer.

And while it is a comparatively simple matter to strike off widths, lengths, depths and heights, it is most difficult to invest these measurements with a living force, in the appealing composite of subordinate lines to the controlling lines of a design, or to invest the main lines of a design with all the fire that lifts a car from the level of a box to that of a carriage. The torpedo style of body as it is called, with all its ugliness of outline, has become a popular car, not because of its exterior recommendation, but because it makes motoring more comfortable through its protective surfacing and encasement.

The governess car at its first inception, was known as a "tub" body, but during the thirty-five or forty years of its existence, it has gradually evolved from a square tub box to a vehicle of some artistic excellence though the same measurements of length, depth and width stand in the same position to-day as they did forty years ago.

The design we give here is mainly characteristic in its controlling back quarter pillar lines, which are long and pronounced and flowing, while the shutting pillar line of the door is fashioned to harmonize and finishes with a scroll end in advance of the door line. The front quarter is made to harmonize, while the chauffeur's driving quarter is conically curved at the top corners from its front vertical line. The sides of the body are cut up in depth, with a narrow panelling which can be sham caned, or finished in picking out and fine-line striping.

The seats of the body are corner curved and finely elbow lined into the top of the body, thus giving a snug and comfortable look to the design as well as doing so in reality.

The back corner pillar of the body is made rounding as shown in the plan, Fig. 4, and finishing on a conical point as shown on the back section, Fig. 2. The pillar is panel-boxed to throw up the moulding as explained in the elevation.

The head is a canopy and covered with fawn-colored waterproofing. The hood is held in a rigid position by the use of side joints. The front horizontal bow slat is made with a swivel joint, the boss of which slides down a rod fixed to the inside of the hoop stick it projects from. This horizontal slat rests on the top of the frame of the windage screen. The whole design makes a very smart car of its kind, and is in outline an advance upon those that are at present obtaining.

The canopy is made portable in its folding arrangement, the front center A, and the back center, B, are parallel, and A fits into B, and thus allows the hood to fall on the hind quarter, the horizontal front slat sliding down the inside rod on its swivel joint.

Fig. 1 shows the elevation design complete.

Fig. 2 shows the half-back section, and the design for moulding spacings together with the formation of the corner pillar in its

boxing and rounding on the extreme point of the bottomside. The rocker part is of $\frac{7}{8}$ -inch stuff and screwed to the inside of the bottomside and finished in the body and rocker paneling as shown in Fig. 2. The width of the canopy's fitting to the body is also fully shown.

Fig. 3 shows the plan of the body, and its contour line, which returns into the elbow point from the full point of turnunder. The bottomside is got out the whole width from the center of the turnunder line to the inside of the bottomside to which the cross bars are framed. The back parts of the bottomside are curved up to take the half lap or slip tenon of the pillar, which should be edge plated to the bottomside, as should the door and hinge body pillars.

The sizes are: Full length of body on chassis, 8 ft. 10 in.; length of hind quarter on elbow line to back of first moulding, $27\frac{1}{2}$ in.; width of door, 23 in.; width of front quarter, 24 in.; width of front door, $21\frac{1}{2}$ in. The top of the door is curved in to match the bonnet quarter top. Width of gearing quarter, 13 in.; depth of belt panel over mouldings up to hind quarter pillar, 6 in.; width of ditto on hind quarter, $10\frac{1}{4}$ in.; depth of front quarter back rest panel over mouldings from top of body, 8 in.; depth of hind ditto, $6\frac{1}{2}$ in.; full length of canopy on head joint line, 8 ft. 10 in.

Width of back of body on the extreme round of body moulding 41 in., over back moulding, 35 in.; width over pillars, 52 in.; width of canopy over slats at side joints, 59 in.; length of back light, 2 ft. 1 in. by 12 in.; depth of rocker, 8 in.

BRAZING APPARATUS.

By George Rice.

There is so much work in automobile repairing that is well and quickly accomplished by employing brazing that a simple device for the purpose, and some of the appliances needed may prove of interest to the small vehicle and wagon repairer who considers the advisability of adding such repairs as a department of his work.

The body of the outfit consists of tiers of brick, firebrick being used where the interior surfacing is exposed directly to the

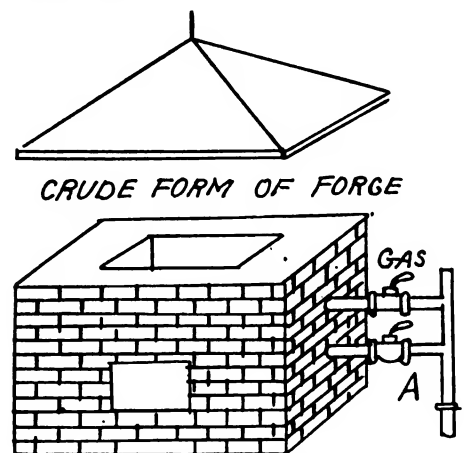


Fig. 1—Brazing Apparatus or Forge.

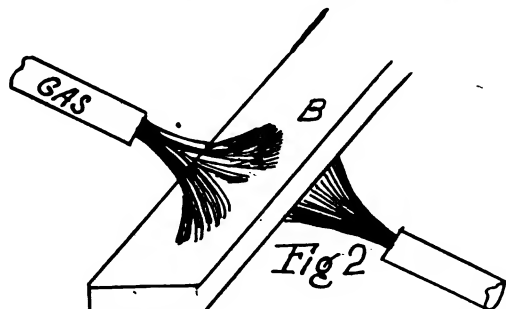
flames. There is a hollow made in the brick in which the pipes meet for the purpose of concentrating the flames. In order to get the intensity of the heat directed upon the work, the flame is confined to a chamber and the work is exposed to the flame there.

In the making of the flame in the bunsen burner type of jets, the gas is drawn from the nearest house or gas main. The object is to get the hydrogen gas to combine with air under pressure,

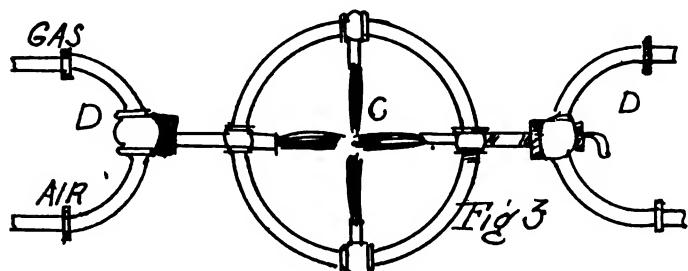
as this increases the force and intensity of flame. You can get a bunsen type of burner in hardware stores, or pipe fitters' stores. Or you can construct one.

Whatever metallic object is placed between the two jets will receive the full force of the flame and become heated through quickly.

The first cut shows plan of the forge-like device with the

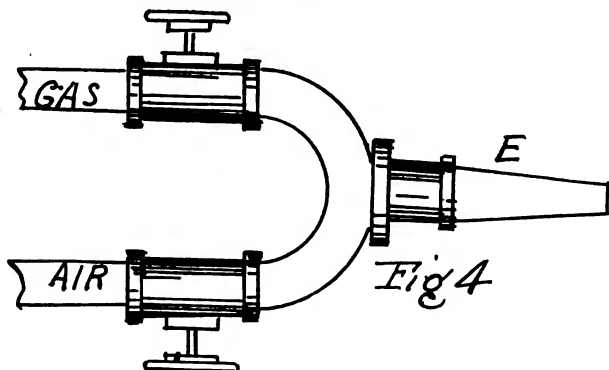


chamber in the middle in which the jets of the combined pipes meet. The system (A) carries the hydrogen gas. There must be another system of equal pattern to carry air under pressure. Usually the air pressure is obtained with a blower consisting of a fan wheel turned by belt power. You might have a lad run a



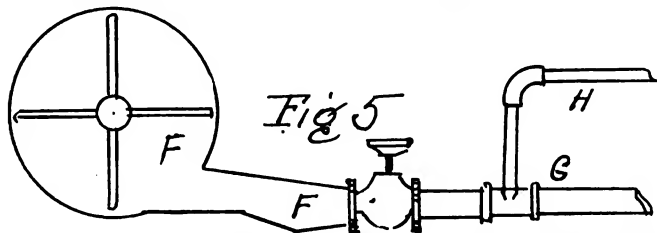
hand crank-power device for this purpose. It is the combination of air and gas under pressure from the double piping that makes it possible to get a bright, intense and penetrating flame.

Fig. 2 shows the plan of the heating on the metal slab for brazing. Sometimes a four-flame jet is used, with the flames cen-



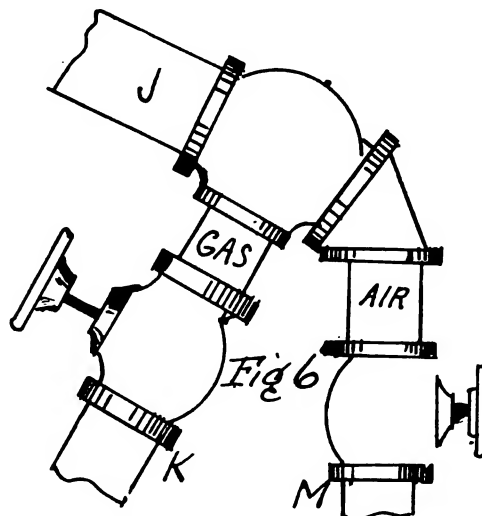
tering at (C) as in Fig. 3. The opposing flames are created by sending in the air and gas combinations from either side as marked (D), (D). This creates a very hot center at (C) and the heat can be utilized in the brazing operation, or can be used to temper tools.

One form of the burner is shown in Fig. 4. You can make



one of these burners without very much trouble. There are simply the two pipes running into the U shaped piece (E). There are the gas and the air pipes, and these pipes receive the air and

the gas respectively. Compressed air may be used, or as before stated, you can generate your gas force with air power developed with a wheel in paddle form which revolves in the oval shaped chamber (F), Fig. 5. The revolving blades of the wheel suck the air in through a bore in the chamber and shoot the air forth along the neck to the main (G). Some of the air may be drawn



out through the additional pipe (H) to a separate brazing device. The main portion of the air passes on to another point of use.

Fig. 6 is a plan of another form of the burner for combining air and gas to a common center for igniting purposes. The meeting point is at (J). The separate pipes for gas and air are designated (K) and (M).

TREATMENT OF RUSTED SPRINGS.

In the columns of The Hub, from time to time, the treatment of spring leaves for rust has been discussed variously. But readers seem to overlook such matters unless they come to them as important in their immediate experience.

We most willingly give space to inquiry of a subscriber on this subject, hoping it may call out from our technicals workers who read The Hub something new. Here is the letter:

We have been receiving your very estimable publication for a number of years and I notice that you have given opportunity for the exchange of ideas in the various departments of the vehicle business.

In this connection, it would please me if you will kindly ask for suggestions as to best manner of treating springs which have become badly rusted, to the end that they will be in the best possible condition for paint.

PRETTY CLEVER JOB.

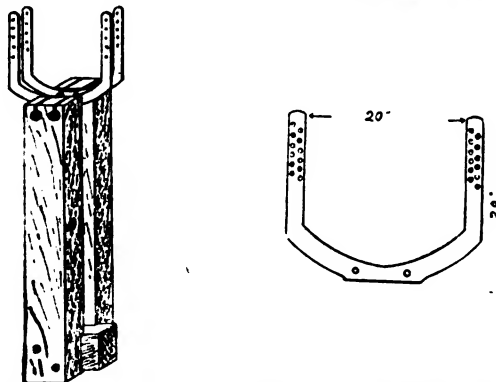
(Illustration on Page 67.)

Among the vehicle fashions this month is one illustrating the Sheridan patent short-turn safety buggy, made by Enterprise Carriage Works, at Knoxville, Tenn. This is an ideal dealers' job, because it has many talking points that the vehicle itself will make good. Its ability to turn unusually short, although possessing the regulation front wheels, is one of them.

WHEEL PIT.

A good wheel is made of two pieces of square girders about ten by ten by 5 ft. 6 inches. A block is let into them at the bottom and bolted together with the block between so as to stand 7 inches apart. They are sunk into the ground and bedded in concrete, the tops standing up about 8 inches. A few iron spikes driven into the bottom ends and projecting into the concrete make the whole a solid mass. The pit itself can be made either by inserting a box and filling in all round with earth, or by fill-

ing round a casing with concrete and afterwards cementing the inside. If the pit is made 3 feet deep, it will afford plenty of room for a six-foot wheel. The holding down gear for the naves is shown in sketch. It consists of two pairs of horns let in flush with inside of top edge of pile so as to protect the edge and standing up high enough to take the largest size nave in use. The upright parts of horns are made of $1\frac{3}{4} \times \frac{3}{4}$ welded at bottom to a piece of $2\frac{1}{2} \times 1$ with a shallow V-shaped recess in middle to take the naves. For small naves battens with slots to go over horns are used to hold down with. They are held by pins in the horns. For heavy naves pieces of spring steel $2\frac{1}{2}$ in. or 3 in. \times 5-16 in., slotted and curved to follow the nave, are used. To protect light naves from cuts by iron the wheeler generally has sole leather



er nailed on to the top of the pile and projecting over the upper cut by the iron the wheeler generally has a bit of sole leather nailed on to the top of the pile and projecting over the upper bearing edge of the iron. To bolt horns on the piles, the tops of the piles are slotted right across, and the bolts are let in, and the slots filled up with strips of wood. These make it easy to put horns on after piles are in position, and easy to take off if needed.

The important thing in a wheel pit is a solid foundation for the nave. The usual method of making them, namely, of two heavy timbers supported at the ends, is defective, as they have a considerable amount of spring, which takes up energy. With a firm foundation every ounce of the blows directed upon the spokes tells, and helps on the work.

RUSTY WHEEL RIMS.

Beeswax has the virtue of aborting rust in rims of wheels of the Clincher type. It combines with iron rust in such a way as to prevent the further formation of the rust. If the beeswax is applied hot, or if the rim is heated before the beeswax is rubbed over the surface, it will serve as an anti-rust coating, nor will the beeswax attack the fabric or the rubber compound of which tires are made. In the application of the beeswax it is not necessary to remove absolutely all the rust from the rim. All that is necessary is to scrape the rim so that it will present a smooth surface for the tire to contact with.

DRILLING PRESSED STEEL FRAMES.

The frame of an automobile is subjected to various strains and stresses, and to the average person these are taken into little account when work of a drilling nature is to be performed. The frame is taken as a framework only, and when a hole is drilled in it little or no consideration is taken as to whether the metal drilled away was vital to the total strength. Body builders, through their workmen, are sinners in this respect. In cases where the side platform irons are not fixed by the maker of the chassis, a certain amount of indiscriminate drilling goes on, with the result that a series of three or four holes may be drilled to hold a simple step just at the point where the strength is most needed.

A pressed steel frame is not necessarily weakened by being drilled provided the hole is made at such points that the strength of the section is not affected. In drilling the outside of the frame, if a point is taken exactly midway between the top and the bot-

tom arm as a center, holes can be drilled almost to any size within reason without altering the elastic limit; but the moment the center of the hole is either above or below this center line the limit is altered and is liable to so weaken the frame as to cause it to crack. With the top or bottom member, the nearer the hole is drilled to the center piece the less likelihood is there of materially altering the strength.

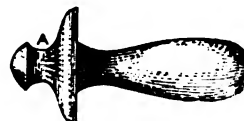
WELL DESIGNED BODY IS WHAT'S NEEDED.

The best designed wind screen in existence does not protect the passenger from side draughts, not even when adopted with a Cape cart hood and detachable side curtains. The process of evolution in motordom has never been marked so far as concerns bodywork. From the very commencement of the industry the matter of bodywork has kept pace with the rapid strides in the perfecting of the power. In the tendency towards uniformity of chassis design still greater attention would appear to have been given to the solution of the problem of the body most suitable to requirements. Based upon the horse-drawn dog cart, the earliest bodies afforded plenty of scope for improvement as necessitated by more rapid travel, and the rear entrance tonneau body which next made its appearance, certainly provided greater comfort for the occupants, although appearance and scientific construction could hardly be counted among its merits. With the coming of the side entrance body, the convenience of the passengers was considerably added to, but the unsightly lines of the tonneau body remained. Then it was, after some few years, that the flush-sided bodies made their appearance.

Apart from the greatly added comfort which this form of body provides, in it are incorporated better lines of more pleasing appearance and greater scientific aspect; nevertheless, when the matter is still further gone into, it is seen that the torpedo body, is capable of still further improvement, and such important facts as reduction of wind resistance and dust raising, comfort, strength, weight and appearance, capable of receiving more pressing attention.

DETACHABLE WHEEL-TURNING HANDLE.

The handle illustrated is very useful in turning wheels with spokes on which there is no projection for the hand to grasp.



One of the principal uses for this handle is for turning the tailstock wheel of a lathe. Some lathes have handles attached and others are made smooth. Place the part marked A in the sketch against the spoke of a wheel and push forward as if you were cranking with a handle attached to the wheel.

WELDING AXLES.

A smith has answered a query about welding steel axles that slip in the handling. He says the lock scarf shown in illustration will avoid all trouble, being made with a fuller and will not



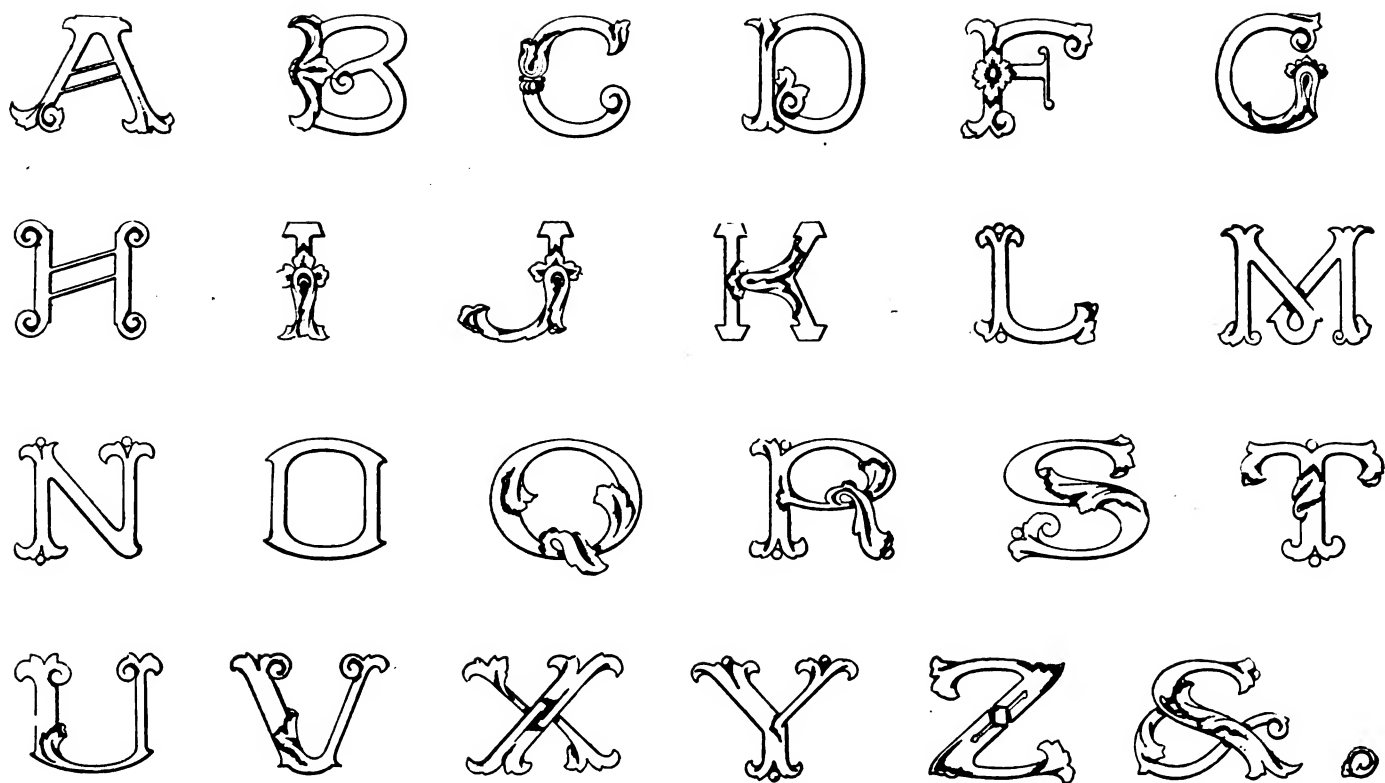
HOW TO WELD AXLES

slip. He recommends catching a heat about four inches long; not to dip axle in sand, but throw a little with borax on top of axle while heat is rising. Almost any heat will weld.

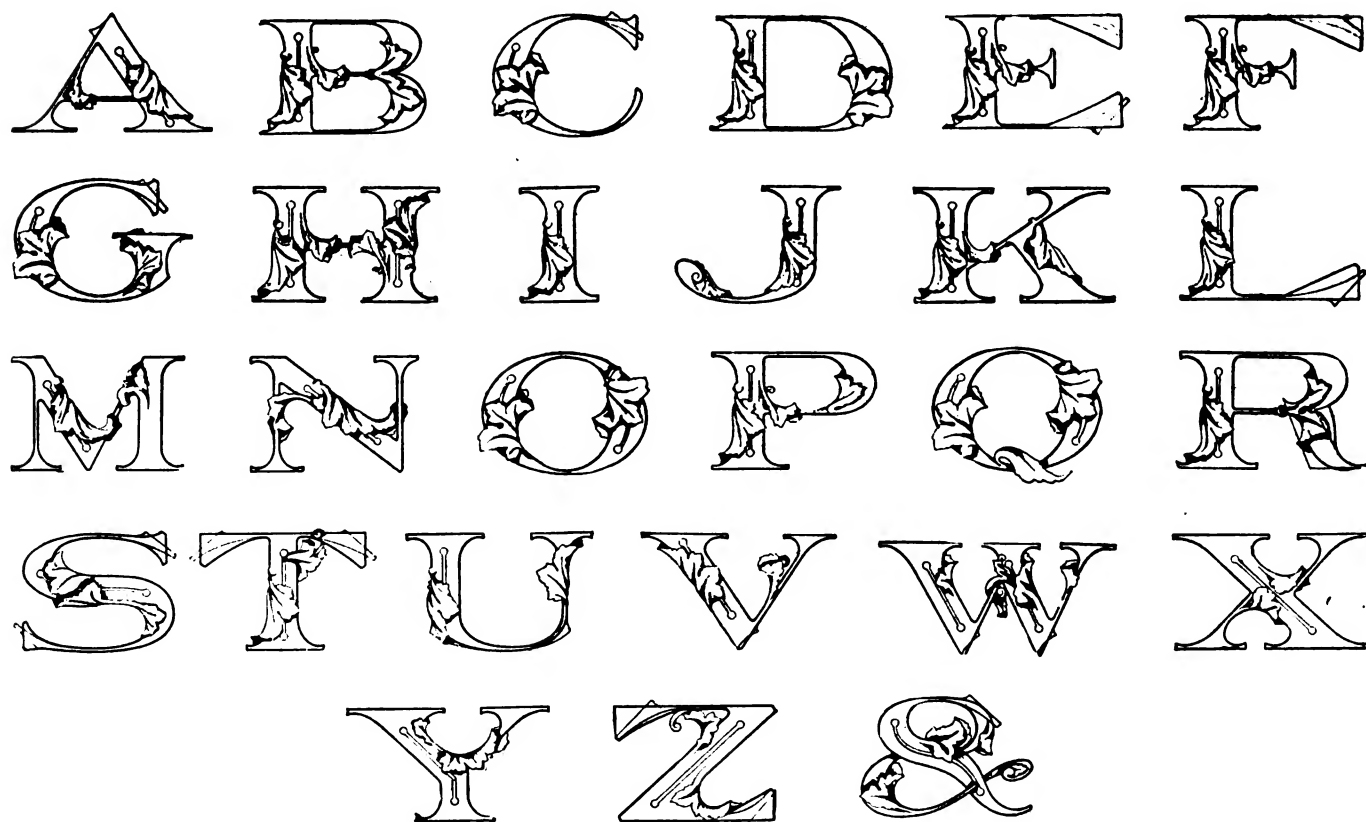
WOOD SHOP NOTES.

A kilowatt of electrical power is equal to 1 1-3 horsepower.

As a lubricant to use on an oilstone, kerosene oil gives the best results, as it not only enables the stone to "take hold," but also keeps it clean and prevents it from filling up.



SUGGESTIONS FOR ORNAMENTAL ROMAN AND BLOCK LETTERS.



COMBINATION ROMAN LETTERS.

Carriage and Automobile Painting

PAINTING AND LETTERING.

((Illustrations on Opposite Page.))

The advent of the commercial motor has widely increased the field of the wagon sign painter, as great demands are made on his services for advertising display on the panels of such vehicles.

The series of articles now running on lettering ought to be of special value at the hour.

In taking up ornamental and fancy letters, we hit a timely class of ornamental painting, as the owner of a new kind of vehicle, as well as a new vehicle is generally ready for the most florid effects.

Once familiar with the characteristics of standard styles of alphabets already described, the painter can try any number of varieties, according to his own or customer's tastes.

Such variations are comprehended under the general title of ornamental letters, and they are legion.

The page illustrations of combined Roman and ornamental Roman and stock lettering ought to be suggestive.

Ornamental letters may be made freely according to the fancy of the painter, and he has his freest scope in wagon body lettering. Any ornament may be used there, and if well done, will always be in place and taste. The painter is not bound down by rules; he is fancy free. The most successful ornamental painter is the one who succeeds in painting a fancy and ornamental letter which yet retains the form of the letter most perfectly.

The best method is to draw in the first place the letter distinctly, then work the ornaments on it, so as to alter the form of the letter as little as possible. Points, pearls, eccentric lines, leaves and vines may be added according to character of the design, or taste of operator. The letter may be made to consist of one complete scroll, or part of the ornaments may be of one color and part of another, while the letter itself may be of still another color, and so on, adding variety without stint.

Any one who revels in forms as an expression will find ornamental lettering a delightful study.

We show an example of making a fanciful variation of the letter R.



POINTS ABOUT LINSEED OIL.

When linseed oil is exposed to the air it takes up oxygen and increases in weight. In the case of films, such as are formed when paint or varnish are spread on a surface, this is accompanied by hardening of the oil, and it is generally agreed that the drying of an oil film is due to the chemical changes it undergoes while combining with this atmospheric oxygen. This process has been the subject of study by paint chemists and oil chemists generally for many years, and has been thought to be well understood. The theory has been that oil contains unsaturated acid compounds which combine with the additional oxygen, and thus form a permanent and saturated body; this dried oil was, by the earlier chemists, called linozyn, and is a tough elastic substance.

Everyone who has gone into a room while the paint is drying must have been struck by the fact that it affords a peculiar pungent odor, acrid and irritating to the eyes and the lungs; this is distinct from the smell of turpentine, being equally pronounced if none is used. This cannot be accounted for by the fact that the oil is taking on something; it is evident that it is giving off something. As a matter of fact, this vapor which comes off from the

drying oil contains various oxidation products, among which are carbonic and formic acids, and even a little formaldehyde. The exact composition, and the proportion of the various volatile products have not yet been sufficiently studied; but it is remarkable that so obvious a fact should not have received proper recognition at the hands of the oil chemists, particularly as it is well known that somewhat similar decomposition products are given off by some of the common oils when they become rancid.

Nevertheless, the fact remains that linseed oil, in films, will take up oxygen from the air and increase in weight from fifteen to twenty per cent. That is, it takes up fifteen or twenty per cent of its own weight more than it gives off. Both gain and loss are going on at the same time; and in about a week there comes a time when the losses balance the gains, and then the gain in weight ceases. This highly important fact, that the apparent gain is really a resultant of gains and losses, has not been properly recognized, and it has been assumed that when the gain in weight ceases, it is because the oil has taken up all the oxygen it can combine with, and has formed a permanent and durable compound, to which the name of linozyn was given.

RUBBING AND FINISHING VARNISHES.

Mr. Kelly, who has but recently issued a book on the subject of varnish (we sell it), has the following to say in a recent issue of Wood Craft.

If the reader is of a mathematical turn of mind, he has doubtless often discussed the relations between several variable quantities which are related, and which influence each other; and by giving all possible value to each factor he has deduced the effect upon the others and has also determined the final result to the whole system.

The idea is this: There is a limit in the combination of the desirable properties which a good varnish possesses, and what is this limit to be? These properties are in rubbing varnish: free working, hard drying, and free rubbing. Next comes the non-liability to crack. This survey gives a set of properties very closely related.

The problem in the making of a rubbing varnish is in ascertaining the limit in the employment of these properties. These ascertained, we produce a perfect rubbing varnish. The varnish maker equal to the solving of the problem finds it a question of judgment, both as to what is best, technically considered, and what will please the user most.

The first quality of a rubbing varnish may be said to consist in free working. This quality may be varied at the will of the varnish maker. He can make a varnish so tough that it will tire the arm and hand of the user to apply it, at the same time setting quickly, and not allowing of its flowing out smoothly, so that brush marks are left. On the other hand, he can make the rubbing varnish as easy flowing as oil itself, so that it will flow out nicely on the largest panel. He does neither, but adopts a middle ground, of course.

With rubbing varnishes it is found in practice that, other things being equal, the free working and hard drying vary inversely. The more it has of the first quality the less it will have of the other. The rubbing varnish made to work as free as average finishing varnish will never become perfectly hard—and the rubbing varnish made tough will dry quicker than any other. When it comes to the question of a quick-rubbing varnish, the problem is: How quick is it safe to make it? The general rule is to make it to dry hard in two days and so that it will not have the least tendency to soften or rub up and sweat.

If the varnish-maker will make a score of samples of rubbing

varnish with the property of free working varied between the possible limits, he will find that at one end of the series the sample will dry enough for rubbing in 10 hours, while at the opposite end the sample will never dry thoroughly hard. Then it is simply a matter of selecting the sample that will dry perfectly in the desired time and work the most free.

While we consider free working the first quality in a rubbing varnish, yet hard drying and free rubbing are the most important matters, free rubbing depending upon the proper drying. True, we cannot work a varnish that is too tough, we must have a free working article, but it must stand the rubbing or it will have to be cast away. So that we have to compare free working with free rubbing or hard drying.

We may get a series of varnishes, as in the first instance, testing them for drying and rubbing, finally narrowing the choice down to one that dries thoroughly in the required time and at the same time works freely. The further we extend the time for the drying the more we improve the free working quality of the varnish. It must dry right to rub well and it must not be hard enough to crack nor soft enough to not dry well.

Now, will the rubbing varnish that we have selected as best rub with absolute safety on time? That is the question we have to meet. It is not difficult to solve. Considered by itself the hard drying quality of the varnish depends upon the quality of the gums used, proportions observed, and method of combining the ingredients. A certain varying of these conditions will result in a series of varnishes beginning with a sample that will dry hard and rub well and have a very fine face in 24 hours. The opposite end of the series may not fulfill any of these requirements in six months. You can see the flexibility of the tests.

Free working may be said to be independent of quality or character of stock, and even to be independent in a large measure of the proportions observed; but in the matter of hard and satisfactory drying we have far more influences to take into consideration, and hence there is more difficulty in getting this property than in that of free working. Of course it is not impossible; far from it, for it is done every day.

What we need to do is to select from the series mentioned the freest working varnish that fulfills the requirements of drying in the right time. The terms hard-drying, good-rubbing and good face are comprehensive, but ordinarily these terms are synonymous and the varnish that is the hardest in drying is the best rubbing and will show the best face afterwards and vice versa.

The third quality of a rubbing varnish is non-liability to crack, a moderately important property and equivalent to that of durability in a finishing varnish. Its limit of good quality is reached where it is beyond possibility of any tendency to being brittle. It is found by experience that those influences affecting this property are such as to make it vary directly with the free working. That is, the freer working a varnish is the less its tendency to crack and to peel.

If carried to the limit, we would have for the most durable rubbing varnish, or the one with the least tendency to crack and peel, the freest working varnish. Or, to put it in other words, a finishing varnish proper. As a matter of fact, for durability alone a coat of finishing varnish is preferable to a coat of rubbing varnish.

But durability alone is not what we want. For if we were to make the most durable job possible it would not begin to have the finish that we are able to obtain with the use of good rubbing varnish for the undercoats. Extreme durability must be sacrificed in order to obtain a good-looking finish. The best average of durability that can be obtained with rubbing varnish is found to be, both in theory and in practice, with a free-working varnish that will be perfectly hard after rubbing. All things being equal, the free-working and hard-drying (especially the former) are a guaranty of non-liability to crack. From this it is very evident that we cannot use any of the desirable properties of a rubbing varnish to a maximum extent but that such use is very limited, and that the limit is reached when the quality is

used to the greatest extent possible, without interfering with other properties so much that the varnish would be unable to fulfill the requirements placed upon it.

Now, regarding a finishing varnish with the like aspect, we find the same to be true. For instance, there is no finishing varnish on the market that possesses the durability that could be given a varnish if durability was the only consideration. There are other very important properties possessed by a finishing varnish, such as color, free working and free flowing; these are of vital importance, and the attention given to these properties, to secure their presence greatly modifies the durability. So it is true of each of the others, viz., of these four properties of a good finishing varnish, the extent to which each can be used is modified by the presence of the others, and this extent can be determined the same as in rubbing varnish.

Just as the adopted standard in different cases may vary, requiring more of this or that property, so the amount of the other properties will have to be varied. Thus in work exposed to the weather, as in railway cars, the greatest stress is laid on durability. In railway work particularly, this is the vital question, even more so than in carriage painting, the finishing varnish must possess extreme durability.

It is a fact, one however not generally known, that railway finishing varnish is more durable than the finishing varnish made for the carriage painter. But the car finishing varnish will be found inferior to the carriage finishing varnishes in color, working, and generally in the flowing. That is, if one property is distinctly modified the others are also.

These statements are useful to any varnish user, as they indicate the impossibility of making a varnish that will excel in every property. If a varnish does excel in any one property, or any two properties, it is fit for a certain purpose, and is as near perfection as we can well expect.

An extremely easy working and flowing varnish is not a high-lustre varnish, owing to the oil in it dulling upon becoming oxidized in the air. Hence the finishing varnish must have a goodly proportion of hard gum in it to make luster, yet if too much be added, especially is this the case if the proportions regarding the liquids be not carefully observed, we shall have a too-hard varnish.

A QUICK SOLID SURFACE OF CARMINE.

First, get the foundation right—compact, dense, and of right color.

Second, use a first-class carmine flooded in a sufficiency of elastic rubbing varnish to insure the maximum brilliancy. Practically all methods of carriage painting, carmine glaze work included, are quick in these latter days, so that our friend has only to bring his work along at a pace equal to his opportunities, to obtain the quick results he has in mind.

To get the foundation in proper shape, make the primary surface just as you would for any color, coating it with lead coats which fill up dense, and close, and fine. Putty very carefully on the first coat of lead, whether the surface is on running parts or body, and in the event of the former, after sandpapering the putty, coat over with two further coats of lead made to dry down flat and smooth. Coarse patches of surface to be glazed over with hard putty thinned out some with turpentine, the pigment to be plastered on smooth to save sandpapering work.

Into the last coat of lead whip enough Indian red to cast the lead to a peach-blow shade. Rub this coat in due time with No. 0 sandpaper to get rid of dirt nibs. For a light carmine, lay on a coat of English vermilion with a bit of the carmine in it to flush it up some. Now beat up $\frac{3}{4}$ -ounce of carmine in a pint of elastic rubbing varnish, stirring the mixture to a smooth, uniform condition, both as to fluidity and color. Using a $1\frac{1}{4}$ -inch badger hair brush, flow a coat of this mixture freely on the surface. Deadens this coat in due time with a piece of fine hair cloth, and repeat the carmine coat, using, however, only a half-ounce car-

mine to a full pint of the varnish. For a hurry-up job out of the ordinary substitute a quick rubbing for the elastic one. For body surfaces brought up with rough-stuff to a perfect condition in all the points of surfacing bring the ground color out in vermillion, and over this, for the finest results lay a coat of the carmine brought down with turpentine to flat out without gloss. Then over this surface cast the glaze coat of carmine, using a pinch of the pigment in the following coat of rubbing varnish.

NATURAL WOOD FINISH FOR THE AUTOMOBILE INTERIOR.

The season's automobile shows have shown the interiors of some of the limousines, and special cars, finished in natural mahogany, cherry, and even sycamore.

The elegance of this wood effect, with the upholstering of a correspondingly luxurious character, must be seen to be appreciated.

The finish, however, must be brought up with exceeding skill and care in order to bring out the soft, rich and completely pleasing effect which the wood is capable of producing.

With mahogany, which is an open-grained wood, a good substantial mineral wood filler is necessary. Never use—except in a case of dire necessity—a cornstarch filler. This is too soft, in the first place, and is subject to shrinkage; secondly, it fades and discolors. The mineral filler gives a solid, enduring surface, unaffected by the things which would practically ruin a cornstarch filler.

Apply the filler with a brush working it well over the surface, taking heed, naturally, that there are no water or other stains in the wood before applying the filler. Permit this filler to stand until evaporation brings it to a "set-up condition," whereupon proceed with a tuft of tow, or soft waste, to wipe the filler off crossways of the grain. The tow or the waste soon becomes clogged or saturated with filler in which condition it is in the right state to work, when handled with a rotary motion, the pigment into the grain. Finally wipe the surface off with clean, soft waste or rags.

Sycamore is said to be a sufficiently close grained wood to make filling unnecessary, but personally we favor using a min-

eral paste filler upon it to make sure of a perfectly solid and smooth surface to finish upon.

Cherry is a close grained wood and requires no filling, but to develop an effect with enough color to make some animation to it a stain of either cherry or mahogany should be used.

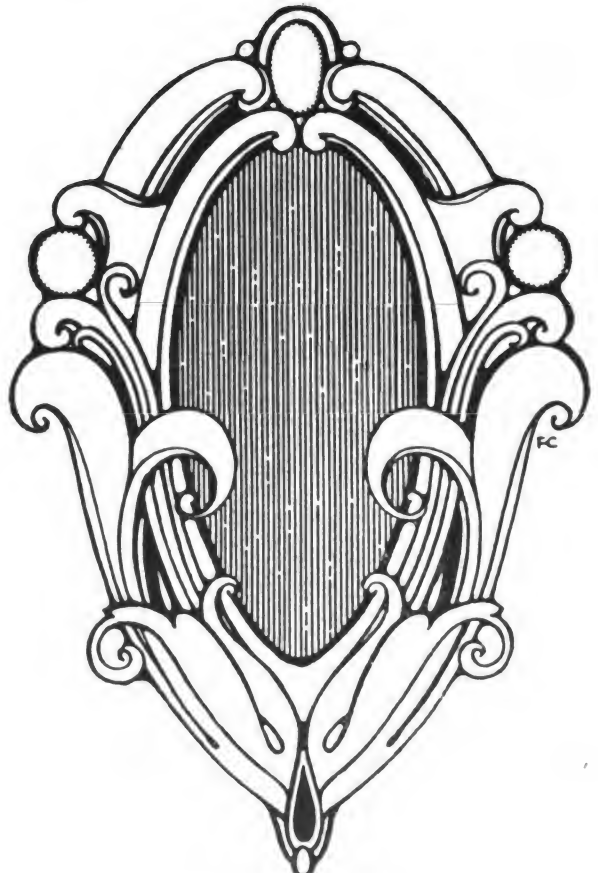
After the filler or stain has dried over night dust off nicely and apply a couple of coats of orange-shellac in as many hours. Shellac is a wonderfully quick surfacing material, but on the ground that it is by nature a brittle one, its use should be confined to barely the first two coats. Then, if the finish is to go in the flat, as Fashion decrees that it must in most cases, apply a coat of pale rubbing varnish, rubbing this coat in due time with water and pumice stone. Apply a second coat of rubbing varnish which in due time first rub with water and pumice stone, after which bring up the flat or semi-gloss effect by rubbing with rotten stone and crude oil.

GETTING BLUE EFFECTS UPON CARRIAGE AND AUTOMOBILE SURFACES.

Nothing in colors surpasses the blue pigments in point of brilliancy and beauty—that is to say, the blues light enough to resist effectively the discoloring and detrimental effects of varnish applied over them. As a matter of fact, clear rubbing varnish to the extent of only one coat will just about destroy all the nice features of the handsomest blue. In making choice of a blue for panel work select the color in as light a shade as circumstances will permit, for, other things being equal, the lighter the color the finer the field effects, for reasons above stated. This advice, however, is not always easy to follow, since the painter proposes and Fashion disposes. Nevertheless, whether the blue be light or dark, begin to bring out the effects by first fetching the preparatory or ground color right up to as close a match to the real blue as possible. Having brought this color along to the real right point, mix up the blue in elastic rubbing varnish, using to each pint of varnish $2\frac{1}{2}$ ounces of blue. Coat the surface in with two coats of this blue. Then surface carefully with pumice stone flour and water and finish with a very pale varnish.



Design for Panel Ornament.



Design for Panel Ornament.

THE WAY "IMPERIAL" WHEELS ARE MADE.

The Imperial Wheel Works in Flint, Mich., is a Durant-Dort proposition. It was established to make the wheels needed for Blue Ribbon buggies, but the output was in excess of such needs so the wheels have been generally marketed, we believe. Now automobile wheels are also turned out and Wood Craft has had a reporter looking over the plant, and we synopsise some of his description:

They have a capacity of 350 sets of automobile wheels and 300 sets of buggy wheels per day.

The concern has supply plants at Dyersburg, Tenn., and Pine Bluff, Ark., where it prepares the hickory and elm stock for its spokes, rims and hubs.

The straight-sawed stock is shipped to Flint, where it is first air-seasoned and then passed through the dry kilns.

Stock for the rims goes directly to the bending department which is very well laid out and equipped. The rim stock is piled onto trucks which pass through a long steam closet, the trucks entering at one end and passing out of the other.

The material is taken directly from the trucks in the closet and passed thence to the bending machine and when a given truck is empty it is removed and the next one forced into position by introducing an additional truck full of stock at the other end of the steam room.

After the stock has been bent, it is secured in position in temporary clamps until dry.

In connection with the saw for trimming the ends of the rims a novel conveyer has been installed for removing the blocks as fast as they are sawed off. This was designed by one of the workmen in the factory and is made from material which was readily available about the plant. The ends of the rims are cut off on a cross-cut saw by placing the rim between suitable guides and feeding it past the saw. As the blocks drop from the saw they are caught on an endless belt, carried up and then dumped into wheelbarrows or trucks. This saves all the work of removing material by the shovel as was found necessary previous to the installation of this simple device.

For finishing the rims, spokes and hubs there are two separate departments arranged on the one floor. The special spoke machinery is placed on one side of the room and the special rim machinery on the other. The vehicle wheels are assembled on the same floor while the automobile wheels are put together in a separate department.

All the operations on the spokes are so far as possible performed by automatic machinery. For driving buggy spokes into the hubs a pneumatic hammer was designed and built at this plant. The pneumatic hammer is claimed to drive the spoke more rapidly and better than the old-style hand hammer with a flexible handle.

The automobile wheels have metal hubs and hence the method of assembling is somewhat different. The spokes are assembled in a special clamping machine, then turned roughly to shape on both sides, and a temporary hub clamped on which holds the parts in position until the tenons have been formed on the spokes and the rims assembled in place. After the rims are in place the wheel is chucked in a special machine, the central portion finished and the regular hub clamped in position. The rims are then finished and the various portions of the wheel completed.

Both buggy and automobile wheels are given a rough coat of paint by dipping, the surplus being thrown off in the centrifugal machine, and they are then sent to the vehicle factories where they are given their final finish.

KANSAS LAW FIXES VALUE OF WORKER'S LIFE.

Kansas is the only state having a workingmen's compensation law. New York had such a law, but the Court of Appeals of New York declared the first compensation law ever enacted un-

constitutional. Kansas was the second state to enact a compensation law, and, since the decision on the New York law, is the only state with a law that rigidly fixes on the industry the damage to persons injured in that industry.

The United States and Turkey are the only countries without compensation laws. The New York law was knocked out because it was compulsory and because the courts held that no provision was made for the doctrine of the assumed risk or the negligence of a fellow servant.

The Kansas law was framed on an entirely different idea. The law contemplates the same general scheme of equalizing the cost of indemnities due to injury or death of an employe by making a fixed charge against the industry in which the accident occurs. Both the employer and the employe must serve voluntary notice that they will come under the provisions of the act before the law becomes binding on either.

When the law becomes effective the "ambulance" lawyer practically will be driven out of business in Kansas, except for personal injury cases of passengers on railroad trains and street cars. He can no longer work up damage suits against labor employers on a contingent fee. The argument that made possible the passage of the law in the 1911 legislature was the figures gathered by the American Federation of Labor showing that of all the millions of dollars allowed by the courts as damages to employes for injuries only 19 per cent ever got to the injured workmen.

The lawyers and courts ate up practically all of the damages allowed. The Kansas legislature set about to change this so that the employe need not go into the courts to collect the damages which rightfully belonged to him, and that the employer would know just what amount should be charged against his business for the injury and death of employes. The law fixes the amount of damages and makes the payments automatic and without resort to the courts.

Under the old system if a man were killed, his wife went into the courts with a suit for damages. As long as the suit was pending it was a lien upon the employer's property. The jury, after a long and tedious trial, allowed the widow perhaps half the amount for which she sued, and when the lawyer got his share and the court costs were paid, the widow and children received considerably less than half the judgment. And this money came only after one to five years after the death of the breadwinner. The Kansas law changes all this. If the employe, killed in any industry, has dependents, the employer has six months in which to pay the widow and children three years' wages of the father. If the employe were receiving a salary of \$800 a year the employer is compelled to pay, without any court proceedings, legal preliminaries or technicalities whatever, \$2400.

The death payment is based on the actual wages or salary received for the year previous to the accident. It cannot exceed \$3600. The widow and children or mother and dependent brothers and sisters thus receive sufficient cash to meet all possible contingencies at once and without any long delay and expensive court proceedings and the payment of one-half or more to a lawyer. The employer knows exactly what he has to pay, and he is not compelled to fight an expensive lawsuit and then have to pay a large sum which the persons in real need receive little and the lawyers much.

If a man should have an arm or a leg cut off or be mangled and bruised so that he cannot work for months, the industry must pay for the support of his family and himself during the period of enforced idleness. The employer is required to pay from one-fourth to one-half the average monthly wage or salary of the employe during the time the employe is unable to work. The amount depends upon the seriousness of the injury.

If permanently injured, the employe is to recover one-half his average wages for a period of 10 years. If only a partial injury, that incapacitates him for three or four months, he will receive not less than one-fourth, and not more than one-half his average wages during the time of disability.

Tire Cost For Trucks.

What it actually costs to operate motor trucks is the most opaque of all the problems that confront the users of automobiles for business purposes. From the first application of power wagons to the transfer and delivery of goods down to the present nothing like a clear, authoritative statement of the cost has been given to the public.

There have been statements of all kinds and descriptions, and it is possible that some of them may have been near the truth, but none to date has been given that carried with it the assurance of authority. All the manufacturers of motor trucks are able to approximately estimate the cost of operation for the first year under certain conditions and to estimate the costs for the second and subsequent years, basing their figures upon the experience each has met with. But as far as the general question is concerned, they may be very wide of the mark as measured by the gauge of actual practice.

The Automobile here presents the phase of truck operation cost contained in the element of tires, with a degree of detail never before possible under any conditions, which we condense.

The life story of 1,000 motor truck tires is told from the moment the tires were put into service until they were useless for their purpose. Six typical American cities were the scenes of these tests, and eight leading makes of tires were used to gain the information.

The field covered was not limited to a series of academic tests but represents actual business under real business conditions. In some paving conditions approach the ideal, while in others the going is bad. The experience chronicled extends over a period of years. The various lines of trade represented in the figures are those that use the motor truck with the greatest strenuousness.

While the average tire equipment of a motor truck costs about the same as a set of pneumatic shoes and tubes for a pleasure car, they give three times the mileage.

The average cost of truck tires per mile per tire, based upon real experience with 1,000 of them, is .00443 cent. That means the tire cost for operating a truck for one mile would be .01772, and as the average load carried by the trucks considered was over 4,000 pounds, the ton-mile tire cost was .00774, approximately. This conclusion is based upon millions of tire miles, carefully recorded and compiled.

The casing used on a touring car lasts about 3,500 miles. The solid tire upon a truck runs 11,182 miles. The touring car tire may last six months, but the truck tire goes along four times that period of time. Sharply opposed to the experience of the pleasure car, the rear tires of a truck are materially longer lived than those of the front wheels. In the pleasure car the mileage from the rear tires is much less than that given by those that do not carry the power of the engine.

The principal sizes of tires examined were 32x4, 32x3 and 36x4 inches. Fully 60 per cent of all the tires used in this illustration were of the 32x4 size. Where all four wheels were equipped with this size the test showed that the rear tires gave nearly 1,000 miles more service than those in front, tire for tire. But the conditions were sharply reversed with the tires of larger diameter. For instance, with the 36x4 inch size the front tires delivered much more mileage. Not all the trucks were equipped with identical sizes of tires on all four wheels.

One lesson that may be drawn is that uniform equipment gives uniform service, and that a trifle more tire substance in front would have a tendency to increase the mileage obtained from the set of four tires.

It is obvious that if a right front tire gives out after it has gone 10,000 miles in conjunction with its colleague on the left

front wheel, the right tire cannot be replaced with a new one unless the truck is given a slight list to the left, due to the lift of the front wheel by the new tire.

This could do the truck mechanism no good, and it certainly would have a bad effect upon a new tire, being larger than its fellows, it would have to bear more of the burden and be subjected to much more than its share of the friction on the pavements.

It is proved by long experience and by the figures at hand that one thick new tire with three old ones is not a happy combination. The corrective measure indicated is to install tire equipment that will give equal service on all four wheels, or at least to arrange matters so that a single new tire will not have to be placed in conjunction with three old ones; or in the alternative to stand the loss of perhaps 1,000 miles from discarding the three old tires in order to keep the truck in operation. Interchangeable wheels would go a long way toward simplifying this phase of the problem.

Of the six cities considered, the one in which the lowest per tire mile cost was experienced was one that has no heavy grades and where also high speed was not practiced. The tire equipment there was the lightest on the general average of any of the cities observed. The cost per tire mile was only .0032 cent, or per truck mile .0128, while the ton-mile cost was .0048. This would indicate that the average load in that city was somewhat over 5,000 pounds. As a matter of fact, most of the trucks were rated at one ton carrying capacity and weight, and consequently they must have delivered a material overload on practically every trip.

The average tire mileage achieved proved to be 12,266, which is only about 1,000 miles per tire above the general average. The marked decrease in per-mile cost is accounted for in the small amount of money outlay for the tires. This resulted from the lighter weight and smaller size used. The average cost per tire was only \$39.39, being brought down by the fact that among the 254 tires used there were 81 that were of 32x3 size. In this city there was a determined effort to limit speed, and, while fifteen miles an hour was frequently made, it is doubtful if that rate was materially exceeded. The average speed there was a trifle more than twelve miles an hour.

The Manufacturers' Contest Association recommends in its recently issued rules that trucks shall not be operated faster than eight miles an hour. If such a rate of speed could be enforced the life of tires would be increased at least 100 per cent on the general average, to say nothing of the years that would be added to the motor and body, and the dollars that would be saved in unnecessary repairs.

The city in which the greatest mileage was obtained from tires is likewise devoid of heavy grades. Only about half as many tires were used there as were in service in the foregoing account of the other town. The average mileage was 15,110 per tire. Here the vast majority of the tires were 32x4, and all four wheels were equipped alike. The tires used averaged higher in price than those of any other city, being \$51.17 apiece. The cost per tire mile was .0034 and per truck mile .0132. The ton-mile figure was .0058, indicating that the average load carried was slightly less than 5,000 pounds. Speed was regulated to a certain extent, but not to such a degree as it was in the city referred to previously. The tire equipment of the trucks of this city was lighter than the general average and was largely of the 32x4 size.

The next city in rank of per-mile tire cost is in New England. The average mileage was considerably over the general level, the figures being 13,470 per tire. The pavements were generally

good and grades were not a material obstacle to progress. The favorite size of tire was 32x4 inches, and the average cost per tire \$50.09, and the per mile tire cost .0037. This would make the truck mile .0148. The ton-mile cost was about the average. There was quite an element of excessive speed in this city, which accounts for the lessened efficiency of tire service as compared with the example immediately preceding.

A big up-state New York town ranks next in order of economy. There were 101 tires used in the service under observation. In this city big tires were the order of the day, and it is interesting to note that the mileage delivered was less than that of the smaller types. The average proved to be 10,617 miles. On account of the size of the tires used, the cost was higher than it was in four of the six cities, and was exceeded in only one of them. The average was \$51.11. The tire-mile cost was only slightly greater than the average, being .0048. This would indicate a per-mile cost of .0192. Because the trucks were generally larger than the average, the ton-mile figures were well under the average in the matter of tire consumption.

Fifth in the list, as far as the tire mile cost is concerned, was a big lake city, where there are a number of moderate grades. Big wheels, fitted with big tires, were used exclusively. Seven different makes of tires were used here, all of which were 36 inches in diameter. The treads being from 3½ inches to 5 inches wide. The 5-inch tires were the worst in comparative performance, averaging only 5,093 miles. The 36x4 tires did not make a very favorable showing here, because in a number of cases this size was fitted to the driving wheels, while the 3½-inch tires were used to equip the steering wheels. It may have been a local condition that brought about the result, but it is quite certain that the best return was not secured. The 36x3½-inch size stood out clearly as the most economical in this city. The fact remains that both of the larger sizes did not make a good showing in comparison with the small size. The cost of tires here averaged \$48.26, which was somewhat less than the average, but the tire-mile cost was .0057. This means a per-mile tire cost of .0228. The loads carried were in excess of three tons, and the ton-mile figures were .0072. The experience in this city would seem to indicate that a little heavier tire in front and a lighter type on the driving wheels would produce more economy in operation. It would also seem to show that the 3½ inch tire was superior in wearing qualities and general service than the wider.

The heaviest tire bills of the series were run up in one of the largest cities in the country where paving conditions, as far as the main boulevards are concerned, are well above the average. It may be noted, however, that the streets are restricted to a considerable extent and trucks are barred from the use of many that are available to the touring cars and horse-drawn pleasure vehicles. There are few hard grades in this territory and the idea of speed has been altogether too much emphasized in importance. The distances are long and the service demanded from the tires is strenuous under all the circumstances.

All these things are borne out sharply in the totals. It was found that in a mileage well over the million mark the tire mile cost was .0065, making the truck mile cost .0260. Added to this striking condition is the fact that small trucks were used and that 32-inch tires were the order of procedure. With six exceptions these were all 32x4 inches. The average mileage delivered per tire was only 7,659 and the ton mile cost was .0113.

No good reason for this showing is presented in the cost of tires because it was well above the average, even of the prices paid for the larger varieties. It was \$50.79, or \$1.23 more than was paid for the general run.

As seven different makes were used, it is to be understood that the quality was equal to that of the tires used in other places and as the items of expense were sharply scrutinized the chances for faulty handling were very slight and do not afford a basis for such a condition as was developed.

The only other factor remaining is the one of excessive speed and that tells the story. It is said that one company operating

trucks in this city makes a practice of exceeding 20 miles an hour on one of its regular schedules. Four trucks are used in this work and it may be noted that one of them has been out of service all the time since the service was 90 days old. This, of course, is due to mechanical difficulties which may be traced directly to the killing speed required and is not due to tire troubles. However, these trucks use up a full set of 32x4 tires, that usually give at least 12,000 miles, in less than 5,000 miles of service.

It may seem to be advantageous to push an automobile truck to the limit of its speed capacity in certain instances and for very short periods, but there is no advantage that can outweigh the disastrous results that must follow the maintenance of a high-speed regular schedule.

The best showing made of any of the 1,000 tires observed was astonishing. This tire, which was 36x4 inches, was on the left front wheel of a two-ton electric truck. It was in service nearly four years, being in regular use for 46 months. It was discarded recently after being worn so thin that it was useless. During its life, this tire did its part in traversing 33,476 miles. This is over one and one-third times around the world. Its companion front tire lasted 33,124 miles. These tires cost \$56 each, which is materially more than the average for this size and about \$6.50 above the general average. The tire cost per mile for the first referred to was .0014. If carried out all around, this would show a truck-mile cost of .0056 and a ton-mile cost of .0028, if no overload was carried. As a matter of fact, as the trucks rated at two tons almost always carry 5,000 pounds or more, the actual ton-mile cost would be about .00224.

On the other hand, the worst showing was made by a 32x4 tire used in the high-speed service more lengthily described above. This tire delivered only 4,324 miles and was discarded after it had been worn through by a long skid with locked wheels. It was thick, resilient and usable in every respect save that about 6 inches of the tread disappeared in the terrific friction of the tire and pavement. This tire cost \$51 and was used on the driving wheel of a one-ton gasoline car.

The tire cost per mile indicated is .0118+, which would make the truck mile .0472. As the car was of one-ton capacity the latter figure represents the ton-mile tire cost. Such an expense for tires, coupled with the high cost of maintenance that must go with excessive speed, would make the operation of motor trucks prohibitive.

Broadly speaking, the lessons learned from the examples observed are included under three heads. Big wheels and tires are better upon heavy grades, but are not so economical where the roads are flat. The 36x3½-inch tires made an excellent showing in comparison with the wider varieties of this diameter. The 36-inch diameter tire did not develop service and mileage corresponding to the increased cost over tires of 32 inches diameter. Also, tire service varied considerably with the different makes and did not follow the lines of cost with much strictness.

Thus it was proven beyond doubt that much care should be used in fitting the tire equipment so that the service on all four wheels may be approximately equal. The figures show that a little more tire in front would help to achieve this end, but that individual requirements must be carefully considered.

Finally, the matter of speed is far and away the most important of all the deteriorating influences to which tires are subjected. At an average speed of 12 miles an hour, the life of a tire may be put down as not far from 11,000 miles. At 20 miles an hour it would be about 4,000 miles. At higher speeds its life would be materially shorter and extremely precarious and uncertain.

At 8 miles an hour the average life of a tire may be estimated at 20,000 miles, but so far complete data on that point is not available, as only a few companies in a few instances insist that such a rate shall be maintained. The difference between the cost of the first speed as against the second, may be stated as follows: At 20 miles an hour, suppose that 4,000 miles are delivered at a tire cost of \$200, the cost per mile per tire would be .0125 and per truck mile and ton mile .0500. With the same equipment at

8 miles an hour, delivering 20,000 miles, the tire-mile cost would be .0025 and the truck and ton-mile costs .0100. That is a difference of 4 cents per ton-mile on tires alone. Added to this difference must be considered the difference in maintenance, which would be even more striking.

IMPROVEMENTS IN MOTOR BODY LANDAULET HEAD FITTINGS.

The constant demand of the public requires feeding in change of design and in inventions that make for a greater perfection in the build and construction of motors that obtain.

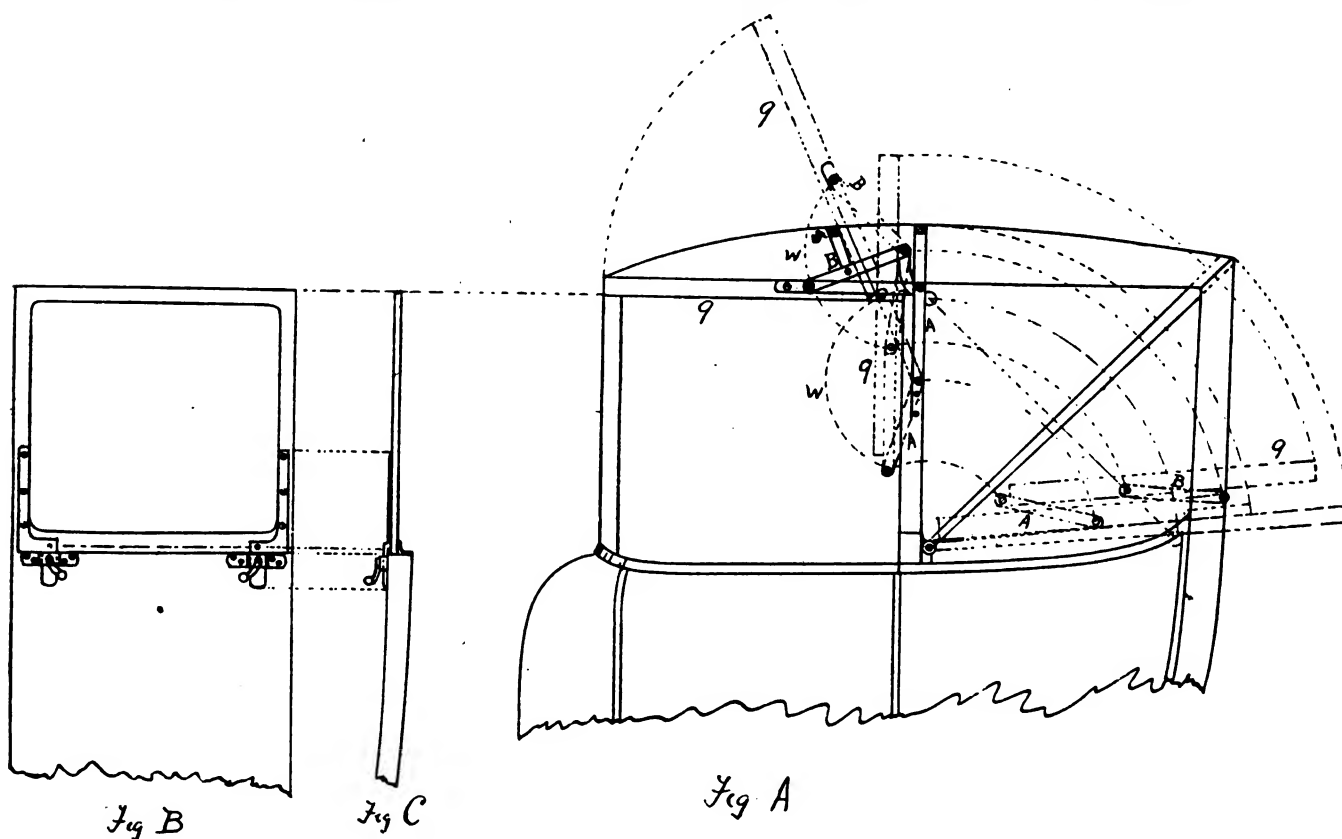
The various mechanisms with which cars are fitted possess an individualism peculiar to each car, hence there is always an individual appealing demand to be met in the manufacture of motor bodies generally.

In the landaulette proper, the head fittings present little or no difficulty beyond that which is the experience of all coach body makers in building horse-drawn landaulette carriage bodies.

or it be used as a close body, with the addition of canvass side fittings made to button on and off. These fittings make the car a most handy and suitable vehicle for doctors, and other professional men.

When the head is folded up the cross flap, *g*, across the top of the door is moved upwards, as at *g*, *g*, by the lever, *B*, *B*. Then the cross flap is pulled outward making the levers travel in circles on their joint centers as at *W*, *W*, and then pushed back to the hinged standing prop. The head is then dropped down on the hinge center, and rests on the elbow joint prop. It will be seen that the principle, when the head is down, is on that of a rhomboidal parallelogram. The front of the roof covering is supported with a slat which is hinged to the top lever, *B*, as at *S*, in the illustration.

Fig. B shows the door fitted with a portable window frame, which is fixed to the door with corner plate fittings dropping into sockets, and secured with lever screws. Fig. C shows the end view of the fittings in position on the door. This improvement practically makes the body a closed carriage.



But the demand for styles of open-sided bodies with a protective canopy, and further beyond this, with fittings of a collapsible character, that give practically a closed and open body, have been productive of strident improvements in bringing this about.

So much so has this been the case that the head fittings of yesterday have become obsolete to-day. That now, it can be practically said, that these canopy fittings have been so perfected in lever manipulation, that they possess all the opening and closing advantages of the more expensive and luxuriously fitted landaulette.

This article is written to post The Hub subscribers up in improvements that will balance them in up-to-date progress.

The illustrations showing the principles of an improved leverage in canopy head fittings describes the working of this invention very clearly in its folding-up mechanism.

Fig. A shows a section of an open two-seated body, with canopy head, fitted with the latest folding improvements. The hood can be used with canopy covering only, or in half hood fashion with the joints folded up in line with the hinge pillar, or in position as in the drawing with only canopy covering and open sides

THE "CONTRACT MOTOR DELIVERY" IDEA.

Contract motor delivery is a new and very profitable business, affording an unusually attractive field of which business men are availing themselves. It is found that in various cities throughout the United States express wagon companies have from 100 to 500 places to call daily, from which they get from 500 to 2,000 packages daily. They receive from eight to twenty cents apiece for delivery to residences within a radius of six miles.

TO BUILD IN DETROIT.

Building of a Detroit factory for the Continental Motor Manufacturing Company, of Muskegon, Mich., will be begun soon, on ground next to the Hudson Motor Car Co.'s plant. The Continental Co. was persuaded to this step by F. O. Bezner, chairman of the Board of Commerce manufacturers' committee, who learned that the company was thinking of building a second factory in Muskegon.

BEING RECOGNIZED.

The following editorial expression from Cooper's Carriage Journal (London) will be very interesting reading to coachbuilders in this country. It begins to look as if the engineer, who assumed to know all about which he knew nothing, is getting peevish because he is being relegated to his proper place.

"Coachwork has now assumed quite an unprecedented importance in the motor car industry. For some three years past we have pointed out the increased interest which the motor car user has taken in the coachwork fitted to his chassis, and have several times predicted that with perfection of the chassis, when the user could count on having an equally good chassis from any of a dozen or more makers, the coachwork would be the important point in the sale of a car. Our predictions have been completely verified, and it may be seen on referring to manufacturers' catalogues, trade literature, and even more by noticing the tactics adopted by salesmen at shows that the motor manufacturers fully realize this. The state of affairs being such, it might be thought that the coachbuilder would reap the reward of his efforts in producing fine motor bodies by obtaining a very much more important position in the trade than he has hitherto occupied. That this is not the case is due to the practical control of the trade by the Society of Motor Manufacturers and Traders, which is managed by a preponderance of engineering interests. It is natural and right that the policy of this association should be controlled by the majority of its members; but this fact has had a very damping influence on the coach trade, which is sparsely represented in the councils of the Society. It must be acknowledged by all parties that the coachbuilders have been obliged to take a very secondary position in the most important exhibition of motors held in this country, and great efforts appear to have been made to place them in the position of accessory traders to the motor engineer who is desirous of selling not only the chassis but the body to the public, and who would prefer to keep the coachbuilder in the background. For all these discouragements, the natural trend of events as indicated above has brought the coachbuilder into prominence in spite of the engineering firms, and, perhaps we may say, in spite of themselves. That this state of affairs is recognized by the motor manufacturers is indicated by the reluctance shown by the Society to allow the coachbuilders to have a collective exhibit under the auspices of the Institute of British Carriage Manufacturers in the annex at Olympia. It has been openly said by several prominent members of the trade that if such permission were given, it would cause visitors to Olympia to flock to the annex to the detriment of chassis exhibitors in the main hall.

"These remarks of ours are prompted not only by your own observation of trade conditions, but also by the efforts of the Institute of British Carriage Manufacturers to better the coachbuilders' position in this direction. We notice that on the agenda of the Institute Council Meeting held on March 31 that one matter set down for discussion was 'The Relations of the Chassis Maker and Motor Body Builder.' This matter was adjourned, and no particulars of any proceedings concerning it are furnished us by the secretary. It is a matter of very great importance, and we are glad to see that the institute has taken it up, and hope that some scheme will be evolved whereby coachbuilders may organize so as to better assert themselves as suppliers of the public instead of remaining accessory to the motor engineers. We have often urged this course, and however much we may regret that our suggestions have not been acted upon before, we must congratulate the institute upon the inauguration of a definite policy in this direction. We feel sure that, having once been commenced, the matter will be energetically handled by the capable men who are at the head of Institute affairs. We are convinced that the trade is waiting for such a lead, and that on the issue of an energetic propaganda the institute will have no reason to complain of lack of support from the coachbuilders throughout the country. We regret that no particulars are given us of any discussion which may have taken place, as we think

that, without committing indiscretions, many details might be made public to the interest both of the coach trade and the institute. We hope, however, to be able to deal more fully with this matter in the near future."

SHIFTING THE CONTROL.

By degrees the levers, grab-alls and such confusing apparatus is on the wane. The time to think and experiment is tending to the simplification of parts.

The latest that has come to notice is the combination control, carburetor and switch on the steering wheel, and here illustrated.



This new arrangement puts the full control of machines right in the hands of the operator and eliminates the necessity of a wild grab at side levers in cases of emergency. This improved auto wheel acts as a safety device not only to the man in the car but to the man on the road as well.

POSSIBLY A GOOD IDEA.

The Commercial Bureau Company has consummated arrangements with the Department of State whereby American consulates are to be equipped with the card catalogue index files as compiled by this company.

The Commercial Bureau Company offers to compile this information for the American Consulates without charge to the American manufacturer. To arrive at the end that all manufacturers of the country may be made acquainted with the privileges offered them through the Department of State and the Commercial Bureau this announcement is made.

This may accomplish a work which is impossible by individuals and can only be made efficient and comprehensive through a central organization when it has the co-operation of the government and others.

Heretofore American manufacturers have had the privilege of filing catalogues in the consulates, but the diversity of size and form of catalogues and other printed matter thus far filed and the filing of this printed matter in English in consulates requiring other languages, has entailed unnecessary time and expense in clerical force, correspondence and translation work in the consulates. It is now proposed to obviate these disadvantages by asking each manufacturer to prepare a brief of his catalogue or printed matter according to card index specifications, these cards to be classified in card index files under proper headings, and to print same in the various commercial languages.

The Metropolitan Carriage Company is erecting a two-story addition to its plant in Bridgeport, Conn.

Automobile Department

MOTOR CAR SPRINGS.

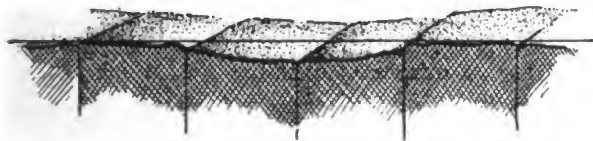
There is all the fascination of the search for the solution of a problem which has hitherto remained unsolved about the effort to attain the perfect spring suspension of the motor carriage. The problem may be described as a compound one, for there are many points peculiar to a motor carriage and the conditions under which it is used, as well as some common to all vehicles.

The use of rubber tires, both pneumatic and solid, has tended to alter some of the relative effects of running on rough or uneven surfaces. If one were to trundle slowly a heavy cart wheel with an iron tire along a given piece of road, it would rise and fall with the surface; set it, however, running down a slight declivity to give it momentum and ensure straight running, and the wheel gradually gaining in speed, would bound from point to point on the road until it reached some place beyond which it could not go. A boy's hoop will act in precisely the same way, regard being had to the relative weights and speeds. The wheels of a motor carriage, running light at a fair speed over the ordinary stone or wooden block paving of the roadway, will bound from point to point in an exactly similar manner. We do not notice this bound action with a brick cart, for instance, for that seldom travels, even when light, at more than 7 feet per second, while the car covers at least four times that distance in the time. If the car and the brick cart were proceeding along the same road at the same pace, i.e., 7 feet per second, the action of the wheels of both would be alike, except so far as the car wheels acted as pneumatic-shod wheels, which, it is well known, do slightly displace portions of themselves to surround minor obstacles on the road which the iron tires would either surmount or crush into the surface of the road.

Photographs have been taken of racing cars turning corners and other similar places, showing one or more of the wheels off the ground, but how they came to be off the ground, or how frequently during each revolution of the wheel they are thus placed, has not yet been demonstrated.

Observations carefully made and notes taken at the time, practically from memory, tell one something of the behavior of an inflated tire passing over such a piece of road as that sketched, but for the purpose of determining with any exactitude the precise parts played by the wheel tire and the springs, such notes and memoranda are not of very great value.

The most careful observer with powerful glasses cannot see exactly just what happens as the wheel meets a depression—



Enlarged section of irregularities in pavement.

whether the wheel tops it and bounces forward or drops behind it, riding upwards and bouncing off for a clear foot or so—and how the springs and body are affected; for the eye cannot retain each detail in exact relationship to the simultaneous events or those preceding or succeeding any particular one. Without this precise knowledge it is impossible to say how any particular disturbance of the body is effected, whether due to the resiliency of the wheel in conjunction with the configuration of the road, or the springs, or all three together, or to a series of minor shocks, none of them important, but synchronizing with the movement of the springs and cumulative in their effect. This knowledge could be obtained by a series of moving pictures of the wheel and spring action when on the road, and would enable manufacturers

to know the exact conditions under which motor carriage suspension works.

There are, however, some points upon which there is already definite knowledge; and until full information is available it may be advantageous to discuss how far that which is known may contribute to the general improvement of motor-carriage suspension.

It may be taken for granted that speed is responsible for the bouncing of the wheels. How much does the resiliency of the tire add to this bouncing?

The lowest accepted pressure will still keep the wheel bouncing, and the weight on the axle will not be sufficient to keep the wheel close to the ground. To prevent the wheel lifting off the ground by its own resilience, the air pressure would have to be reduced and the air tube left insufficiently inflated, so that the wheel, in passing over the inequalities of the road, would automatically vary the air pressure in the tube by compressing the tire. The walls of the latter would have to be constructed so that they would act very quickly, as the leathers of a pair of bellows,



Bouncing action of wheel over rough road.

and they would, in consequence, be very apt to wear out in less time than they do now. With a tire not sufficiently inflated, the wheel would follow the road surface; there would not be any bouncing due to the high resiliency of the tire, and progress along the road would not be quite so fast as with the properly-inflated tire.

The question to be answered in respect to the part the inflated tire plays in the bouncing action of the car is, what is the safe working minimum volume and air pressure per 100 lb. load on the axle to reduce bouncing to a minimum, having regard to the life of the tire and speed on the roads?

If the problem were merely that of providing a soft cushioning of the road shocks, due to inequalities, at a speed of 7 feet per second, nothing could equal the pneumatic tire inflated to a low pressure, and there would not be any necessity for steel springs, or long, easy, laminated steel springs could be used with steel tires. But, as speed up to 28-30 feet per second is a sine qua non, then it is necessary to reconsider the position. Pneumatic tires were not introduced for the purpose of attaining high speed, neither were laminated springs; the first object in both cases was to reduce the effect of road shocks; the first fact discovered by their use was that speed was increased by the reduction of shocks and of draught.

It is in the direction of the proper combination that increased comfort and incidentally increased speed, or reduction of effort, will be found.

Helical springs have frequently been introduced into road vehicle construction, but no instance is known of their being an unqualified success, and they are not used alone in any motor carriage. The helical spring can be made to a very fine adjustment; it can be made in great numbers to respond equitably to any load either in tension or compression, and this is a very valuable quality for many purposes. The laminated spring, made up of a number of plates, cannot be depended upon to respond with certainty to any degree to any given load. There is not an equal deflection for an equal load. Friction between surfaces is as the weight and not as the area. But to produce friction there must

be contact, and the closer and more even the contact between the plates, the greater the area of friction surface to carry the weight. The laminated spring is generally given some bend or compass, and a usual allowance for the deflection under load is one-half of the compass. A spring, therefore, with a compass of 9 inches has a possible movement under load of 9 inches, while one of half that amount would move only $4\frac{1}{2}$ inches. The movement of the load on the springs may therefore be regulated, in a measure, by the compass given to the spring.

Laminated springs, ever since their first introduction in the late sixteenth or early seventeenth century, have been found to be the most serviceable form of coach spring. The early examples, of which there are some in certain Continental museums, show that they were made long, broad, and thin in proportion to their breadth. It was only about 120 years ago that they were used, of smaller size, for two-wheeled carriages, and they maintained the proportions of the larger coaches. Later, it was customary to make the plates narrow and thick in proportion. Now we have reverted to the practice of early days in having motor carriage springs long and broad, this method evidently being the best form of construction for heavy weights and rough roads.

The pneumatic tire with one tube and the laminated spring may be considered as the survival, up to the present, of the fittest method of absorbing the road shocks incidental to the speed at which cars usually travel. The shocks may be regarded as numbering from 1,500 to 2,000 per minute at a speed of about 20 miles per hour over the ordinary macadam or paved road. On some roads the shocks would be about half. It is evident that something which will respond quickly and moderately, as to its range, is required to meet the case.

The effect of the use of springs of considerable compass, it might be supposed, would be to push the wheel into all the road depressions, but the springs would have to be light; consequently they would be greatly deflected by the load, and, having a long range of action, would add considerably to the bouncing of the load about the road. Relief will not be found in this direction.

Springs of very high quality steel, specially fitted up with very little compass, and so made that the deflection will not be excessive for the compass, with sensitive ends and strong centers, should be the best. The limitation of the movement of the load, i.e., all above the axles, should be the object aimed at, for if the main springs are supported at a point where they are deflected beyond the normal under standing load, or a restraining force be applied to the load when it has been set in motion by the action of the springs over the inequalities of the road, momentum being given to it by the rebound of the spring, combined with the possible action of the tire over inequalities and bouncing, then it will be possible to regulate the action of the springs.

The more the problem is studied, the greater is the difficulty of asserting that any particular course of action will be the correct one for all cars in all circumstances. Some of the conditions peculiar to the motor carriage, and common to all styles of it, have been set out, but not all of the peculiar conditions attached to the suspension of the car, of which the resilience of the wheel and the action of the springs form a part.

SOLID TIRE STANDARDS.

The problem of standardizing felloe, band and tire dimensions for solid tires has been reduced to a solution and is now proposed for acceptance by the Society of Automobile Engineers. Final action was taken at a meeting of the sub-section of the standards committee held in New York May 4. The proposed standards are in the form of recommendations to the entire standards committee, which will pass on them by mail vote, after which they will be submitted to the council and later to the membership of the society for ratification.

The most important points covered by the committee's report are the adoption of a permanent metal band to be placed on all wheels prior to shipment by the wheel makers, the establishment

of specific wheel diameters to correspond with nominal tire dimensions, and the definition of a stated width of felloe and band for each wheel size. The new standards are designed to reduce the heavy burden on the industry which has arisen from the necessity of carrying needlessly large wheel and tire stocks and to eliminate the cost to the user of remodeling wheels when adopting new styles of equipment.

The recommendations of the committee are expressed in the following specifications:

"Metal Bands—There shall be a permanent metal band on all wheels in advance of shipment by wheel manufacturers.

"This metal band shall be one-quarter ($\frac{1}{4}$) inch thick on wheels for single tire equipment up to and including four (4) inch nominal width of tire; and three-eighths ($\frac{3}{8}$) inch thick on wheels for single tire equipment above four (4) inch nominal width of tire; and three-eighths ($\frac{3}{8}$) inch thick on wheels for dual equipment of all tire sizes.

"Wheel Diameters—There shall be a constant wheel diameter over the metal band, for all widths of solid tires of a given nominal overall tire diameter. Nominal tire diameters shall increase or decrease from thirty-six (36) inches by even two (2) inches.

"The constant diameter for a wheel taking a thirty-six (36) inch tire shall be thirty (30) inches over the metal band, and shall increase or decrease by even two (2) inches for tires larger or smaller than thirty-six (36) inches.

"Single Tires—The width of felloe and band shall be three-quarters ($\frac{3}{4}$) inch less than the nominal width of the tire equipment for same. For example, the standard felloe width of four (4) inch single tire equipment shall be three and one-quarter ($3\frac{1}{4}$) inches.

"Dual Tires—The width of felloe and band for dual equipment shall be twice the nominal width of each of the dual tires. For example, the standard felloe width for four (4) inch dual tire equipment shall be eight (8) inches.

"Tolerance Over Metal Band—The tolerance allowable in the circumference of metal bands shall be as follows:

	Minus.	Plus.
Before application to wheel	0	1-16"
After application to wheel	0	$\frac{1}{8}$ "

"Minimum Depth of Wood Felloe—The minimum depth of wood felloes shall be as follows:

Inches Tire Size	Inches Felloe Depth	Inches Tire Size	Inches Felloe Depth.
2	$1\frac{1}{4}$	$5\frac{1}{2}$	2
$2\frac{1}{2}$	$1\frac{1}{4}$	6	2
3	$1\frac{1}{2}$	$6\frac{1}{2}$	$2\frac{1}{8}$
$3\frac{1}{2}$	$1\frac{1}{2}$	7	$2\frac{1}{8}$
4	$1\frac{3}{4}$	$7\frac{1}{2}$	$2\frac{1}{8}$
$4\frac{1}{2}$	$1\frac{3}{4}$	8	$2\frac{1}{8}$
5	2	Above 8	$2\frac{1}{4}$

"All of the foregoing provisions for non-demountable tire equipment standards, viz., equipment of wheels with metal bands, the constant diameter of wheel over metal band, the stated variation of wheel diameter, the width of felloe, the tolerance over metal band, and minimum depth of wood felloe, shall apply to wheels for demountable tire equipment."

The National Association of Automobile Manufacturers passed resolutions endorsing the work and urged its members to be prepared to adopt such standards not later than July 1, 1911, and to put them into effect not later than January 1, 1912, recommending that the tire and wheel manufacturers as well, make preparations to the same effect.

The consideration of the specifications by the standards committee at large, the council and finally by the entire membership of the society is looked upon merely as a formal, but necessary, process of ratification.

The tire manufacturers, on whose support the success of the undertaking really hinged, responded with alacrity. Their support, in some instances, involves the sacrifice of considerable in-

vestments in processes, the construction of new molds, even alterations in the "sections" of their products, and, in one or two instances, alterations in methods of attachment.

Wheel manufacturers were particularly anxious to secure standard dimensions, being influenced largely by the waste involved in the past, necessity of purchasing large stock of lumber far in advance of market requirements in order to season it properly before use. They were also in favor of uniform banding of wheels as that precaution will go far toward preventing the deterioration of stocks held in storage.

The burden on the truck user of non-standard tire equipment is held to have been one of the causes of the high tire costs which almost universally are complained of. Not only will the user profit by being freed of the necessity of changing wheels when changing tire styles, but it is believed that market conditions will be considerably improved by the superior competitive advantages which will be certain to result from uniform specifications.

THE KIND OF HOOD TO HAVE.

From a practical point of view I have yet to see the hood that is, in my judgment, thoroughly sensible. And with the intention of stimulating invention, or at any rate discussion upon this important topic, I propose briefly to describe what form such a hood should take. Before doing so, I would point out that few, if any, combination bodies are worthy of consideration. Either you must have an open car or a closed one; the detachable top system never fulfils the promises made for it. In these days of the quiet car, the smallest intimation of a squeak or rattle will not be tolerated, and it is not infrequently the case that it is at the points at which the combined bodies are joined that noises occur.

It may appear to many to be a simple matter to construct a satisfactory detachable top to provide an enclosed car, nevertheless, this is an error. A gentleman desired me to furnish him

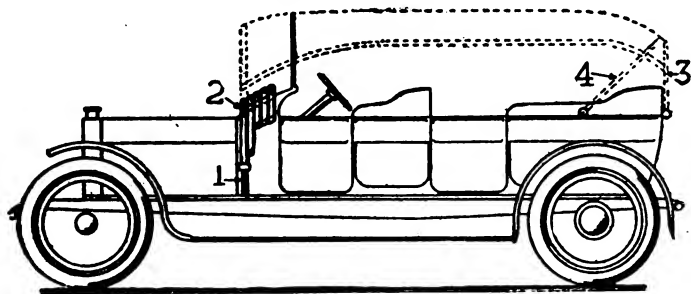


Fig. 1.

with an original design for a really practicable hood—something that should act satisfactorily in fair weather and foul, and was neat in appearance, both open and closed. How far I was able to comply with this request is shown by the accompanying drawing (Fig. 1) which illustrates the plan so clearly as almost to be self-explanatory. The front of the specially-shaped collapsible hood (shown at 2) is supported by the pillars (1) on either side of the dashboard. Over these pillars hollow tubes are adapted to be telescoped. When the hood is raised vertically by sliding the tubes (holding the front of the hood) upwards and fixing them on their pillars by appropriate clamps, the hood is pulled back over the car (as shown by the dotted lines) and fastened to the jointed rod (3), against the top of which a jointed strut (4) is placed in order to afford extra strength in drawing the hood taut. When the strut is out of use, its jointed end is moved forward along a slide and the whole pushed down to lie horizontally along the top of the panel.

The reader, says *The Motor*, can gather easily enough that, by taking advantage of the now highly-popular deep and wide "turtle-back" dash, an excellent position is offered for the hood which, when closed, is folded snugly over the dash aforementioned. The hood is not liable to become damaged, and, no doubt, either canvas or a metal case could be arranged for it—to exclude dust,

etc.—if desired. A special hood of this kind is, naturally, capable of adaptation to any car where there is sufficient room between the dashboard and the front seat. It will be observed that its forepart is deeper than the rear, a reversal of the ordinary style, thereby securing augmented immunity from the weather, not merely for the occupants of the front seats, but shielding the screen also.

As for the general appearance of the hood, I apprehend that few will deny the neatly compact effect that is achieved; many a magnificent car is marred completely by the hideous bunch of sailcloth hanging astern. Moreover, there is no question that the only proper situation for a car cover is in front, and anyone who considers the matter carefully can, I venture to think, come to no other conclusion for a number of good and sufficient reasons, which will duly suggest themselves. Touching the strength of the

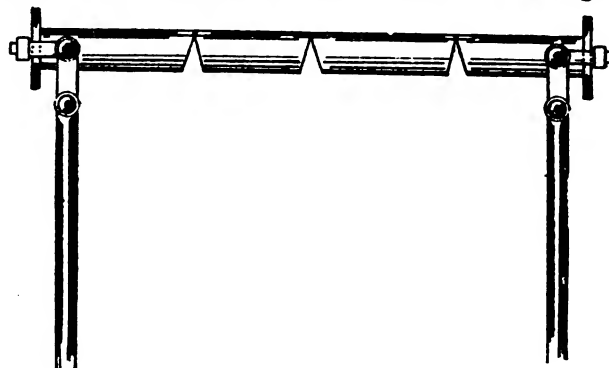


Fig. 2.

apparatus, I would say that provided the forward pillars and their encircling tubes be of stout material and well secured to the dashboard, such a hood may confidently be relied upon to withstand much hard wear.

The subject of adequate hood protection from the weather has, long ago, received my attention, and in this connection, an early idea of mine, which might readily be put into practice, was the utilizing of the roller-blind principle for hoods. But since the hood, when extended, must take the form of an arch, and a blind can only be unrolled from off a flat, cylindrical member, the exercise of a little ingenuity is requisite to obtain a serviceable arrangement. In the sketch (Fig. 2), I show how I would propose to make use of a flexible roller which, while the cover is being extended, remains straight, but which, when that procedure is finished, may be arched to give the necessary curve wherefrom the rain-water may run off.

MATERIALS FOR TOPS.

The materials used in top manufacture are cotton twill, mohair, leather and imitation leathers. The twill and mohair combinations are largely used for tops for cars larger than a demitonneau, while for high-grade runabouts and victorias leathers and imitation leathers are often used. The class of goods that sometimes finds its way into cheap tops is not waterproof, and, in the case of a heavy downpour or of exposure for any length of time in the rain, will permit the moisture to penetrate and leak through into the car.

The usual material employed is made of two layers of fabric cemented or vulcanized together with a rubber compound. This makes the two layers as solid as if of one piece and renders them waterproof. The rubbering or vulcanizing process is the most important. Upon the manner in which it is carried out, the amount of rubber used and the quality of the rubber will depend its serviceability. The exterior and interior layers of fabric often differ in quality, and where mohair is employed the exterior layer is mohair while the backing is usually cotton twill. A cheaper class of material is plain twill, where two layers of the twill are vulcanized together.

The appearance of a top made of mohair is superior to that made of ordinary fabrics. It has a luster and is non-absorbent;

consequently the rain runs off it easily. Mohair is goat hair, and is a good deal coarser than cotton; consequently the meshes of the weaving are larger than those found in cotton twill. There are several imitations of mohair which are in reality made from cotton, with a little silk added in the manufacture, to give the required luster. In these, the silk very soon wears off, leaving the material ragged. The mohair stratum is very thin and when seen in the unsolutioned state has the appearance of a thick veil. For this reason it is inclined to wear and fray if the slightest friction is allowed while the top is folded. Mohair requires very careful handling in the manufacture, and only the best quality of rubber solution should be used with it; otherwise it will become detached from the foundation and fray.

Gray is popular in top manufacture. It is composed of alternate strands of gray and black hair, but can be varied in many ways to give the requisite shade. The color of the material used is no indication of the quality, although if a special shade is desired that does not come through in the ordinary course of manufacture it will probably cost more to have the material specially dyed.

Where a leather effect is desired a material known as auto leather is largely employed. It has the appearance of leather but is in reality a composition that is mounted on suitable backing, either of cotton, wool or mohair. Cotton is often used, owing to the fine mesh and its ability to more readily absorb the waterproofing material. Any type of leather can be imitated nowadays, ranging from a delicate morocco to the ordinary hide variety. Sun, heat and damp are the enemies of this material, as it is liable to crack, in which case the rain will find an easy path through the cracks and in time it will rot the backing.

FARMERS WANTED THREADS OF NUTS AND BOLTS STANDARDIZED.

Because farmer who till the soil of Michigan could not obtain at hardware stores nuts and bolts that would fit their threshers, mowers and other agricultural apparatus, the automobile manufacturers, in common with the other manufacturers of that state were put to it to justify their use of nuts and bolts that could not be applied to the farm implements. Accordingly the legislature introduced House Bill No. 224, proposed to "regulate the sale of vehicles, implements, machinery and mechanical tools in that state, and to provide a punishment for violations." The act sought to make it unlawful after January 1, 1915, to manufacture or sell such articles as those specified unless they employed the United States standard taps and dies. Failure to comply with the act entailed a fine of not less than \$10 or more than \$200, or imprisonment of from 10 to 90 days, or both.

As bolts made by United States standard taps and dies have only coarse threads, the bill set the manufacturers of Michigan by the ears. They sent to the capitol at Lansing a strong delegation to oppose the passage of the bill. Among those in attendance and who represented the automobile industry were Henry Souther, president of the Society of Automobile Engineers, and Messrs. Coffin, of the Hudson Motor Car Co., Wills, of the Ford Motor Co., and Huff, of the Packard Motor Car Co.

The arguments presented were sufficient to kill the measure, but so far as the automobile industry was concerned it is likely to result in several changes in the A. L. A. M. standards, as, for instance, the provision for a square instead of a round bottomed slot in castle nuts and alterations in two or three head sizes. The Society of Automobile Engineers has the matter in hand and it shortly will be brought to a focus.

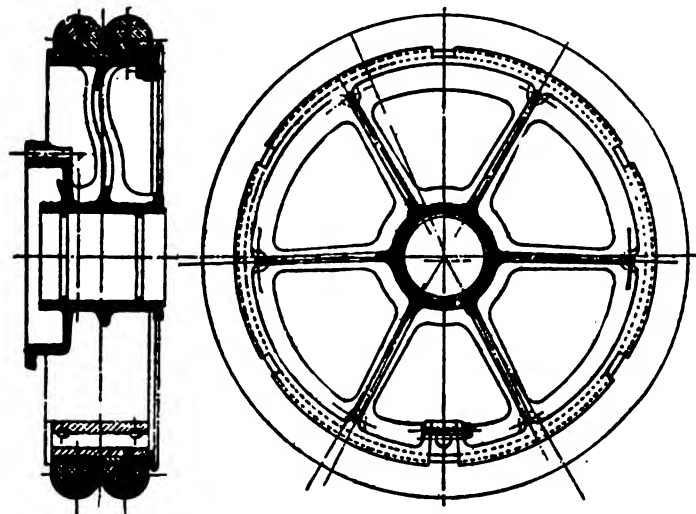
WORKING NIGHT SHIFTS.

The Wisconsin Motor Manufacturing Company's new plant at West Allis, Wis., is now fully completed. A night shift has been put at work. Charles H. John, president of the company, reports that the company is doing a good business in its new location.

EXPANDING WHEEL FOR SOLID TIRES.

While the attachment of demountable tires to wheels frequently has been secured by contracting the rim over the wheel, it remained for a British designer to conceive the idea of securing the same effect by expanding the wheel within the rim. This novel principle is effected by the special design of an original form of steel wheel which is faced to the proper diameter to form a driving fit within the rim. Instead of being formed with a continuous felloe band, as is customary, however, the rim of the wheel is separated by transverse grooves which are tapered from side to side of the wheel and which are reinforced by inwardly extending flanges. After the rim and tire have been placed in position the wheel is expanded by inserting wedges in the grooves which separate the segments, the wedges being secured in position by means of bolts and nuts.

The general arrangement is plainly indicated by the accompanying illustration, which shows but one transverse groove in



the rim of the wheel. The number of grooves employed, of course, is determined by the diameter of the wheel, a large wheel requiring a greater number of segmental sections than a small one. Another feature of the system which the illustration shows is the transverse curvature of the spokes. This is necessitated by the need of safeguarding against straining the metal when springing the rim, or felloe band, down to a smaller diameter in order to remove the tire.

In order to effect a replacement it is necessary merely to remove the bolts holding the wedge, or wedges, in place, knock out the latter and then contract the wheel by clamping together the flanges on either side of the grooves. After the process has been reversed in replacing a tire, the pressure exerted through the compounding effect of the bolts and wedges is sufficient to hold the tire firmly in position without other means of fastening and with absolutely no danger of creeping.

CHANGES IN PERSONNEL.

W. M. Lewis, of the Mitchell-Lewis Motor Co., Racine, Wis., announces that James W. Gilson has been made an officer and director; Henry Plow, manager of the London branch; H. E. Redman, assistant treasurer; William H. Armstrong, office manager; W. L. Day, general sales manager, and Charles A. Armstrong, assistant general sales manager.

HEARST'S TRUCK CONTEST DOES NOT OCCUR.

The truck contest which W. R. Hearst's Los Angeles Examiner programmed for the three days, May 1 to 3, did not occur. Failure to receive sanction and rules were among the several things responsible for its abandonment. It is stated that the Los Angeles truck dealers will be called together in an effort to revive the project.

The Automobile Axle.

The processes of elimination and evolution through which front axles and steering knuckles have passed have received as careful study as any other part of a car. The safety of those who ride is dependent on axles and steering knuckles more than on any other part.

The first automobile axles generally were round or octagonal, closely following the design used by manufacturers of horse-drawn vehicles. Usually they were made of wrought iron in two pieces and welded together in the middle. Objections to such axles were that the round or octagonal section is by no means the lightest for its strength, and that there was a weld in the middle where the stress was greatest. In spite of these objections, however, many such axles served years of useful service.

As automobiles increased in size and power, the desire to reduce weight led to other designs being used, and the axles were forged out of a solid piece of steel instead of being welded. During the course of the evolution, a great many patterns were tried out. By degrees, the faulty designs were weeded out until at present the principal sections in use are the solid rectangular, the round tube, the square tube, and the I-beam, the latter being by far the most popular and the one which is seen most frequently. In practice, the I-beam section generally is made with its width about seven-tenths its height.

In comparing the advantages of these several sections, it is necessary to consider the stresses on the axle. The principal stress is the vertical one due to the load, and is very easily calculated. In the case of front axles, there probably is very little other stress as long as the vehicle is traveling on a good road and going straight; but when traveling on a bad road there will be considerable longitudinal stress which may be augmented by diagonal stress. The action of the car in rounding corners also causes a certain amount of longitudinal stress proportionate to the length of the car, the angle at which the front wheels are turned, and other factors.

The reason for the popularity of the I-beam section is due in the greatest sense to its relative strength for weight, though the comparatively low cost of manufacture and its adaptability also are factors in its favor. Experiments have shown that to carry a given load a solid square axle will be lighter than a solid round one, and that the weight is still further reduced if the axle be made rectangular with its height greater than its width. With the tubular and I-beam sections the weight is reduced still further as the sections may be made of greater dimensions and less thickness.

There is a very decided limit beyond which the section will fail from buckling, and further, a tubular axle may be so thin, and still carry the load, as to be liable to other injuries. Engineers agree that it is unwise to use tubular axles in which the thickness of the walls is less than one-tenth of their vertical height.

For the reason that the horizontal strength of the I-beam section is relatively small, being about one-fourth of its vertical strength when the section is seven-tenths as wide as it is high, this form seldom is used for rear axles. For front axles the horizontal stresses are not so great.

This shape may have been adopted because of ease of manufacture, the grooves being milled or forged out, though it is more likely that it is because of the added strength in other directions than the vertical.

The square tube axle has a good horizontal strength and is of the necessary lightness, though an objection is found in its weakness diagonally. Often the combined vertical and longitudinal stresses on this form of axle will cause a diagonal stress. It is not now much used, its place having been taken by the double

channel section in which diagonal stresses are taken care of by telescoping two single channel sections and riveting them in the form of a rectangular box.

Round tube is equally strong in any direction and is employed on a number of cars. Wherever it is used it has given perfect satisfaction, and appears safe to allow as high a working stress on it as with a solid round axle.

The practical difficulty with the tube axle at first was the designing of a neat and strong arrangement for the steering pivots. In the I-beam section this is comparatively easy, the jaws being forged of the same section. Originally the ends and spring seats of tubular axles often were malleable castings and not always well designed. As a result, trouble was the rule rather than the exception, and probably gave the tubular section an undeservedly bad name. In present day practice the use of better materials and methods has so far perfected the tubular axle that cases of failure of either the axle or the steering pivots are rare.

In practice, the question of what is a safe working load to be carried on the different types is the essential one. Many of the old solid axles carried tremendous loads, stresses as great as 18,000 lbs. per square inch being common, and the wonder is that they ran for years and apparently gave satisfactory service. As the present types of axles are made of steel without weld, it might be expected that they would safely carry higher stresses, but as a matter of fact, few manufacturers load I-beam sections to a stress much over half this and some put in axles large enough to keep the stress down lower.

In addition to being of sufficient strength to hold up the load of the vehicle, front axles must also be so arranged as to permit of the car being steered at will. Obviously the method of steering horse-drawn wagons and carriages—by means of a movable axle which revolves on a "fifth wheel"—is unsuitable for automobiles, if for no other reason than that the stability of the car would be greatly reduced if it were built that way. Naturally the stability of a horse-drawn carriage need not be as great as is required of an automobile, because of the lower rate of speed of the former. But there are other reasons why such construction is not possible in automobiles; one of them, and an important one, is that the steering wheels, in turning the car, must describe concentric arcs, which is to say that the inside wheel must be turned at a greater angle than the outer in order to maintain both wheels in the same curved direction without side-slip.

The problem of stability and easy steering has been overcome by providing a rigid axle connected to the car frame and mounting the wheels on movable pivots. These pivots are of three general types. The first type of steering knuckle to be used is known as the Ackerman or Elliott type.

The yoke is forged integral with the axle, the spindle on which the wheel is carried fitting into it and being held in place by means of a pin. The weight is carried on roller bearings. The reversed Elliott type differs from the Elliott in that the yoke is made integral with the wheel spindle, the end of the axle being so formed as to fit into the yoke. In this case the weight is carried on ball thrust bearings. The third, or Lemoine type, is quite different from either of the other two. The axle end is formed into a socket into which the spindle is fitted.

As it is evident that if the steering wheels were maintained parallel at all times, side-slip would result, it is equally evident that some means must be provided for altering the angles of the wheels automatically.

Though it is not possible to cause the wheels to assume the proper relative angles for every curve, an average is obtained by making the arms which actuate the steering pivots turn in, away

from the wheels, thereby shortening the cross rod which connects the two pivots (when the rod is placed behind the axle), or making them turn out and thereby lengthening the rod when it is in front of the axle.

In the Hudson design the tie rod is placed behind the axle and consequently the steering pivot arms are turned in toward the wheels.

With the latter arrangement, any effort to change the direction of travel will cause the arm of the outer steering pivot to approach the right angle with the car axle. Likewise the arm of the inner pivot will move proportionately away from the right angle with the axle. As the inner end of the tie rod approaches the car axle it is evident that the inner steering pivot must describe an arc of a greater number of degrees than the one which is described by the arm of the outer pivot. Consequently the object of securing a greater angular inclination of the inner wheel is accomplished and the proper difference for all usual conditions is approximated.

THE AUTOMOBILE BOARD OF TRADE.

A meeting of the directors of the Automobile Board of Trade, which will comprise the members of the Association of Licensed Automobile Manufacturers and others, was held May 21 in New York city and the following officers elected:

President—Charles Clifton.

Vice-President—Charles C. Hanch.

Treasurer—Col. George Pope.

Secretary—Benjamin Briscoe.

Acting Manager—H. A. Bonnell.

The following are the charter members: American Locomotive Co., American Motor Car Co., Apperson Bros. Auto. Co., Autocar Co., Bartholomew Co., Brush Runabout Co., Buckeye Manufacturing Co., Buick Motor Co., Cadillac Motor Car Co., Chalmers Motor Co., Columbia Motor Car Co., Corbin Motor Vehicle Corp., Dayton Motor Car Co., Elmore Manufacturing Co., Everitt Metzger-Flanders Co., H. H. Franklin Mfg. Co., Haynes Automobile Co., Hudson Motor Car Co., Jackson Automobile Co., Knox Automobile Co., Locomobile Co. of America, Lozier Motor Co., Matheson Motor Co., Maxwell-Briscoe Motor Co., Mercer Automobile Co., Metzger Motor Car Co., Mitchell-Lewis Motor Co., Moline Automobile Co., Alden-Sampson Manufacturing Co., Moon Motor Car Company, National Motor Vehicle Company, Nordyke & Marmon Co., Oakland Motor Car Co., Olds Motor Works, Packard Motor Car Co., Pierce-Arrow Motor Car Co., Pope Manufacturing Co., Premier Motor Mfg. Co., Pullman Motor Car Co., Reo Motor Car Co., Royal Tourist Car Co., Selden Motor Vehicle Co., F. B. Stearns Co., Stevens-Duryea Co., Peerless Motor Car Co., Studebaker Auto Co., E. R. Thomas Motor Car Co., Waltham Mfg. Co., Willys-Overland Co., Winton Motor Carriage Co.

RATES UNCHANGED.

The subject of concessions in vehicle rates to Texas was discussed at a meeting held in Chicago by representatives of nearly all the large vehicle concerns, and representatives of the railroad lines. The object of the meeting was to formulate a request to be filed with the railroad companies for changes involving the rates and minimum weights on carload lots from Chicago, St. Louis and other manufacturing points in the middle west to points in Texas. It was understood that whatever bases were applied to Texas would be later made applicable to Oklahoma, Arkansas and Louisiana points.

It was impossible for the shippers to agree on account of diversity of interests involved. There were four classes of vehicle manufacturers represented. First, those manufacturing and shipping implements as well as farm wagons; second, those making farm wagons only; third, those manufacturing buggies and wagons; fourth, those making and shipping spring delivery wagons and farm wagons. The manufacturers of light vehicles were will-

ing to stand an advance of 6 cents per 100 pounds in the rate, providing substantial reductions in minimum weights were granted. The manufacturers of heavy vehicles and implements were unwilling to have the rate advanced, claiming that reduced minimum weights would be of no advantage to them.

CHALMERS SAYS THERE IS NO SLUMP, "FROM WHAT HE CAN LEARN."

"The entire automobile industry from all I can learn from reliable sources," said Mr. Chalmers, "is now enjoying one of the most prosperous seasons it has ever known. This condition, in my opinion, is bound to continue for all of the well established companies. I believe that business generally is going to improve.

"The weather has been a bad drawback to automobile dealers in the small towns and rural districts, and one of the encouraging features of the season from our standpoint is the large volume of business that has been done in spite of adverse weather conditions.

"I often hear it said that the country would be in a bad way if the automobile business were to have a bad slump. That is probably true, but I just want to assure business men that, so far as I can see, there isn't any danger of a slump in the automobile business. The reports of our company to-day show that we are employing just three times as many men in our plants as we did at this time last year.

"I am familiar in a general way with the plans of most of the manufacturers and I am quite sure that none of the makers of the more popular priced cars has any intention of announcing 1912 models for some time to come. Besides that, I do not look for any radical changes in 1912 models over those of 1911."

Mr. Chalmers also said that he expected to see prices remain steady, as there has been a falling off in the number of what the automobile men call "fly-by-night concerns." Furthermore, all the established companies arranged for conservative spring outputs, and it is already apparent that the output of all of the well known manufacturers combined will be well within the demand.

IMPORTANT REORGANIZATION.

With C. H. Tangeman, of New York, and R. E. Graham, of Reading, Pa., figuring as incorporators, there was chartered under the laws of Delaware, the S. G. V. Co., with authorized capital stock of \$400,000. This marks the beginning of a considerable change in the affairs of the Acme Motor Car Co., of Reading, of which Graham is vice-president and general manager, and of the Hol-Tan Co., of New York, which has the American agency for the Lancia car, of which Tangeman is the leading spirit. J. M. Quinby & Co., the Newark, N. J., body builders, also are interested in the project.

For the time being S. G. V. Co. will be the holding company for the Acme concern, the name of which, however, shortly will become the S. G. V. Motor Car Co., taking its title from the car which the Acme company has produced during the past two years. As is fairly well known, this car is practically a reproduction of the Italian Lancia, and is claimed to be the only successful duplication of a foreign car that has been achieved in this country. If anything, there are those who consider it an improvement on the original. It has given such a good account of itself that compelled the attention of Tangeman and the other Hol-Tan principals, and Mr. Tangeman's connection with the S. G. V. Co. grows out of that fact. The Hol-Tan Co., however, will continue to handle the Lancia car, but hereafter it will be sold side by side with the S. G. V.

Mr. Graham probably will be the head of the new enterprise, so far as factory operations are concerned, and it is probable that H. M. Sternbergh, Jr., who is identified with the Acme Company, will also play a part in its affairs.

COMFORT OF PASSENGER A "PETTY DETAIL."**A Review of What Has Been Done in 1910 According to the "Engineer's" Viewpoint.**

Looking back over the events of the past twelve months it cannot be said that development or improvement is particularly marked in respect to any one detail or any one type of automobile, save only the aeroplane, says Automobile Engineer. Improvement has been no less noticeable in 1910 than in former years, nor even has the rapidity of improvement slackened perceptibly, but it is becoming increasingly difficult to judge the quality of a chassis by inspection only, as the difference between goodness and indifference lies now more in detail than in general. Recently The Automobile Engineer remarked on the undoubted fact that manufacturers are beginning to pay more heed to the results of laboratory research or experiment, with great advantage to the efficiency of their cars, but it seems that they are giving equal attention to petty detail wherein affects the convenience or the comfort of the driver or passengers. Thus, in not a few instances, it may be observed that a car, which appears unaltered when viewed casually, has had its few troublesome, if unobtrusive details improved very greatly, while it is usual to find that the running is distinctly better than before, either by reason of greater power or greater smoothness and greater ease of control.

For experimental study makers have most commonly chosen the engine, their investigation being directed towards obtaining the maximum power with definite cylinder dimensions. Many other manufacturers have given more attention to the removal of noise in the transmission, and a much smaller number have tried to improve both parts. As regards the former case, the result has been to increase very considerably the average piston speed of car engines, while the results of the second line of inquiry have so far been so small as to be little more than nothing. Also, of course, there has been considerable experiment with new engine systems throughout the automobile industries of the world.

Concerning engine improvement, it may be questioned whether the time has not come to change or modify its direction somewhat. By comparison with three years ago, or even a year ago, it is now possible to get very high power from very small cylinders, but the higher speed of rotation and piston translation thereby entailed usually causes quite perceptible and distinctly unpleasant vibration when the engine is developing its full power.

If not yet, it is certain that quite soon the elimination of vibration will be one of the chief tasks before automobile engine builders, and this may fittingly be given first place in the list of principal problems of the day.

The use of the worm and the great strides that have been made in bevel gear manufacture have almost solved the problem of obtaining a quiet "direct" drive from the engine to the road wheels, but the effect has merely been to divert the issue which is now to get the indirect gears as soundless as the direct—a much more difficult task. We have already remarked that but little progress has so far been made, and it is therefore reasonable to give this question a position of equal importance with the first named. It is not our present purpose to suggest ways and means, but there is, perhaps, some reason for the belief that the evolution of a silent change gear system lies deeper than the mere making of accurate gear teeth, and may indeed lie so deep that the way out will be found to be the abolition of the present type of gear box altogether, with the substitution of an entirely different mechanism. It is apt to be forgotten that it is not long since everyone cried out against the unmechanical brutality of the sliding gear system, and though the brutality has been softened by detail improvement, it is still there. In the hands of a poor or indifferent driver the gearbox is now the least satisfactory and most easily damaged part of a chassis, and that some radical change will take place in the near future is very probable. Epicyclic change-speed gears have been tried thoroughly in England and in America and it is safe to say that they have been

found wanting because of their elaborate nature. If they are made well enough to be quiet and efficient they are very costly, while if the really essential four speeds are given the complication is very great indeed. The chain may have a future for change-speed gear work, but cost is again against it—though to a lesser degree—and the durability of short chains is too little assured for it to be possible to forecast events.

Meanwhile, the most striking fact in connection with power transmission is the establishment of four speeds instead of three as the standard arrangement, and this is a splendid instance of the inevitable ultimate survival of the best form of construction.

The subject of transmission introduces another problem which is the determination of the best ratios of the four speeds with regard to general convenience and utility. Makers of similar engines are by no means agreed as to the best average speed (or normal speed) for those engines. For any engine and any normal load there should be a best series of ratios, and it appears that there is room for further investigation with a series of different conditions. Possibly an equation could be found whereby the ratios might be determined from the bore of the engine, the bore/stroke ratio, the number of cylinders and the weight of the chassis.

The next question is one which is less a matter of theory than the accurate observation of successful practice, with correct deduction of cause and effect therefrom. The somewhat indefinite quality commonly known as "holding the road" is not possessed by every car, and there are but few that hold the road thoroughly well. Cars of older types with much greater weight by comparison with their power than present patterns, were not usually sinners in this particular to the same extent as is now noticeable. Thus improvement in one direction has led to some retrogression in this one way. It is probable that the liability for a car to skid, sway, or roll is wrapped up with errors of steering, distribution of weight and flexibility of springing, but most likely steering error accounts for the greater part of the trouble.

"Holding the road" is perhaps a little difficult to define, but it may be taken to mean that there is no conscious effort needed to keep the car in a straight line or on a moderate curve when traveling at high speed. As has been already hinted, some of the latest "high efficiency" chassis are far from good in this respect—in fact, some of them are so bad that they would almost be dangerous in the hands of an inexperienced driver. The increasing tendency to cant the steering pivots inwards at the top does not seem to exercise any definite influence, and, also, it is certain that flexible springs do not necessarily act detrimentally, though hard springs generally seem to minimize the tendency towards discomfort at high speeds. Much concerning this matter has been learned at Brooklands, but it is not quite conclusive for road work, because the type of chassis vibration set up by the unevenness of the cement is not the same as that caused by a rough road, where the inequalities are mostly smaller and more frequent in occurrence.

To what extent skidding in mud is related to the chassis proportions rather than to the surface still remains one of the unsolved problems, but it is probably precisely the same as that of "holding" a dry road, and there is some reason to think that a car with radius rods to the back axle is less liable to skid than one which is not so fitted, although, of course, the influence of such axle staging is a very great deal less noticeable than of bad steering.

The points so far considered chiefly affect the comfort of the car, and the next item which needs particular attention is the efficiency, not in terms of the power developed by comparison with the weight or size, but in terms of work done per unit of fuel and oil consumed. It is, of course, true that gasoline forms but an insignificant part of the total of the yearly running expenses of a car, but it is scarcely wise to neglect it altogether, as too many carburetor designers have done. It is still unfortunately true that very many cars are improved by their purchasers by the alteration of the existing carburetor or the substitution of a differ-

ent type, while if manufacturers acted wholly in their own best interests, no improvement should be possible. Things are now much better in this particular than they were not long ago, but much remains to be done, and it must be done by organized research. There must be a best general type of carburetor for general all-round purposes, and the very large number of designs in use proves that the best type has either not yet been found or nor yet been appreciated. Several well-qualified investigators are giving their attention to the carburetor problem, and it is to be anticipated that some valuable facts will be ascertained from their experiments, but it behooves manufacturers to encourage such research, and to endeavor to profit by it rather than to disagree with their own much more rough-and-ready experiments.

STATISTICS OF CRUDE RUBBER.

The India Rubber World is responsible for the statement that sixteen years ago the entire annual rubber supply of the world amounted to 35,000 tons, of which about one-half, or 17,000 tons, came to this country. Seventy per cent of that was used in the manufacture of rubber boots and shoes, the rest going into a miscellaneous assortment of rubber goods. The amount of rubber consumed in the manufacture of tires was almost negligible, certainly not reaching 5 per cent. But all that is changed, and while we received in this country last year about 42,000 tons of rubber, 60 per cent of that went to the tire manufacturers, and the rubber footwear men, manufacturers of mechanical goods and druggists' sundries, and all the others, together, only got 40 per cent of the rubber imports.

The demand for articles of all kinds manufactured from rubber has increased with every year, and the demand for tires has grown with great rapidity, while the supply of crude rubber has increased very slowly. For instance, the consumption of tires in 1908 increased 150 per cent over the preceding year, and in 1909 showed a still further increase of 100 per cent., while during those same years the crude supply increased only 5 per cent. each year. While during the year just closed the demand for tires decreased slightly from what it was in the previous year, this condition is obviously only temporary.

Now the outlook is that there will be an increased supply, but that it will come slowly. Of the 73,000 tons of crude rubber produced last year, 38,000 tons came from Brazil. That is, of course, all wild rubber, gathered along the tributaries of the Amazon. It is estimated that only one-tenth of the possible rubber supply of Brazil has even been tapped. If this is true, there are 400,000 tons of excellent rubber along the Amazon which could be taken out each year.

ATTACHING RUBBER TO LEATHER.

Owing to the grease the last-named substance contains, it is very difficult to secure rubber to a leather surface. The Gummi Zeitung recommends, as best adapted to accomplish the purpose, quick, cold vulcanization process, using strong chloride of sulphur solution. The leather must first be superficially freed from grease by treatment with benzene, applied by means of a brush or sponge, which dissolves the grease and carries it into the interior substance of the leather away from the surface. It is also recommended to apply powdered pumice stone, heavy spar, chalk, or some other similar substance to the dried leather surface after washing out the grease, not using too much, however, as this would form a dust layer between the rubber and the leather and prevent adhesion. The rubber surface must be coated with a rubber solvent or cement, so that its substance when pressure is applied, will be forced into the porosities of the leather, and it should be allowed to dry well on the rubber before the two are brought together. If the work is given proper time to dry after vulcanization, a good adhesion can be effected it is claimed in the manner above described.

READY FOR BUSINESS.

About fifty friends of J. "Army" Bent journeyed from New York to attend the opening of Craig Manor Inn at Baldwin, N. Y., of which he is the new proprietor. The entire party made the journey in automobiles, and arrived in time for dinner, and it was "some" dinner, such as only "Army" can get up.

Besides being a good vehicle man, Mr. Bent has cultivated a



J. "Army" Bent.

taste for fine cooking, and it is this accomplishment that bids fair to make him famous in his new business.

The boys toasted the new owner and Craig Manor Inn, and the drive home in the wee small hours was full of pleasure.

To our readers who will seek the best while in New York we suggest a trip to Craig Manor Inn. Ask any vehicle or automobile man in New York and he will direct you. It is official headquarters for C.H.A.T. members.

WHAT IS SOLID GASOLINE?

Solid gasoline is a stiff, jelly-like transparent substance having the characteristic odor of liquid gasoline. It is easily cut up into blocks for packing and is perfectly safe as regards risks of possible leakage and evaporation. As a fuel for motorcar engines extensive trials have proved that it compares very favorably with liquid gasoline. It is claimed that the actual consumption of solid gasoline under similar conditions is much lower than that of liquid gasoline. Moreover it has the notable advantage that no special carburetor is required. The solid gasoline generates gas automatically under ordinary atmospheric conditions, therefore by simply passing air over pieces of solid gasoline contained in a box an efficient explosive mixture is obtained. A considerable simplification of the car would result, there would be no leakage, flooding or needle valve grinding, or any of the usual carburetor defects to contend with. It is claimed that the mixture obtained by simply passing or inducing air over the solid gasoline is a very homogeneous one, and this ensures perfect combustion. With liquid gasoline the formation of a homogeneous mixture is rather difficult to obtain, special means having to be employed to ensure a sufficiently fine breaking up of the liquid into particles to obtain perfect combustion. The solid gasoline gives off a "dry" gas, which means that it is in the finest possible state of division or perfectly atomized. Apart from its application as a fuel for motor car engines, it can be used for car lighting.

THE HOME OF GUAYULE RUBBER.

There are garden spots in old Mexico, but travelers are invariably impressed with the immense stretches of land which seem unsuited to any requirement of civilization. Little grows upon these practically desert areas save the cacti, and, among the rocky surfaces of the low-lying hills, an uninteresting and dusty shrub called "guayule."

This particular brush had no part in the argicultural development of the country, being looked on as a weed of no utility, but on the other hand, of no alarming menace, as it was seldom found on land required for crops.

It seems that for ages it had been the habit of Mexican boys and girls to make for themselves crude balls, having the elasticity of rubber. And they secured the material by chewing the stems and branches of what is known as the guayule shrub. This continued to be a sport of the little Mexicans without attracting any marked attention until one day, about twelve years ago, a German resident in the republic had an inspiration. He had in his possession several of the crude native rubber balls. The idea flashed over him that the guayule rubber might be made an article of commerce and he began his experiments.

In time a quantity of the guayule shrubs was taken from Mexico to Germany, and the subsequent experiments gave to the world a new source of rubber. The German finally returned to Mexico and equipped the first practical plant in that country.

The extent of the trade to-day, and the part it plays in supplying the demand for rubber, is shown by the estimate that the value of the guayule shrub now standing on the lands of Coahuila is \$65,000,000. There is as much more in Chihuahua and other mountainous Mexican states. The Mexican owners of guayule land are seeing that the shrub is gathered in such a way that the supply will not be exhausted. Plants are being left in sufficient quantities to reseed and replace those which are cut down and taken to market. The land on which the guayule grew a few years ago was practically valueless. It is now in big demand.

Shipments of crude rubber from Mexican plants from November 23 to December 14, 1910, amounted to 1,474,000 pounds. Large capital has recently become interested in the manufacture of crude rubber from the guayule shrub. An effort is being made to build up a large market in Europe, and shipments have gone to England, Germany and France, this, of course, in addition to the very large and remunerative shipments to the United States. It is said that the rubber trade was not aware until recently of the enormous production from this new source. In many instances guayule rubber lost its identity when it passed through the refining process and went upon the market, and but for the consular invoices of shipments and the official report of the Mexican government, which are open to the public, it is probable that it would have been a long time before the importance of the industry would have become generally known.

As to the cost of manufacturing crude rubber from the guayule shrub, estimates are from twenty-five to forty cents a pound, and some place the cost as low as ten cents per pound. The profit depends largely upon the price paid for the shrub and the expense of delivering it to the factory.

Despite the great quantities already cut, there still remains an enormous acreage, and in many places the plant is reseeding. One of the most important companies having factories at Cedral and Viesca, is now cutting the second growth from its plants. The guayule shrub does not require cultivation, but freely reseeds. It requires from five to six years for the shrub to reach a growth where it is available for cutting.

The process of extracting the crude rubber is simplicity itself. The shrub, which grows to a height of three to four feet, has a number of gnarled wood trunks springing from the roots. The rubber is extracted from the woody portion of the shrub where it lies as a stick sap, between the outer bark and the wood fibres. This sap, in fact, is a wise provision of nature to protect the vital heart of the plant.

The shrub, cut by native peons under the direction of con-

tractors, is brought to the factories in bales weighing about three hundred pounds each. The shrubs are spread upon an endless canvas belt, which conveys them to a cutting grinder, where the plant, including root, branches, leaves and bark, is cut into minute fragments. The mass is then sent down to a lower floor, where it is dumped into a series of revolving metal tumblers, or drums. These drums are about five feet in diameter, of the same height, and are placed upon a shafting which revolves them simultaneously.

The drums are lined with a hard material of great resisting power, and in each tumbler is placed a number of pebbles ranging in size from a hen's egg to a goose egg. These pebbles are extremely hard and smooth and are imported from Norway. The tumblers are about half filled with the ground guayule shrub and then water is let in until the mass is thoroughly covered. The revolving process then begins and is continued for six or seven hours.

The tumblers are arranged so that the upper lid will become opposite a trap door in the floor. When the first stage of maceration is finished, the doors are open and the contents conveyed to large shallow vats where the mass is allowed to remain for about twenty-four hours. During this period the fragments of bark and wood become water-logged and sink to the bottom, leaving the rubber substance, which resembles bran mash, on the surface.

This is skimmed off in due time and then given another thorough washing to remove any foreign substance or useless fibre. The residue is now taken in baskets to hydraulic presses where it is subjected to powerful pressure until all the water is forced out. The guayule is now a shapeless biscuit, or cake, of a light olive color, and is undoubtedly rubber. The cakes require a final process before they are ready for shipment. In each plant are several peculiarly constructed machines with corrugated rollers. The cakes are run back and forth for some time between these rollers while being subjected to thin streams of hot water falling from pipes that are placed over each machine.

This kneading is done very carefully and thoroughly, and when the cake is finally completed it has only to be dried before considered ready for shipment. The drying is done on racks in the open air. The entire process requires about forty-eight hours, and is done with ordinary labor, there being little expert handling required.

The importance of this new industry not only to Mexico, but to the American investors, can be judged when it is understood that Mexico produced about 30,000,000 pounds of rubber in 1910, which sold at an average price of 65 cents, or \$19,000,000 for the total output.

JOHNNY WISE.

There was a man in our town,
A regular Johnny Wise;
He took no stock in catalogs
And cheap "mail order" lies.
When he needed farm machinery
He'd drive right into town,
Hunt up a well known dealer
And plank his money down.
The best was none too good for him,
He wanted goods "worth while,"
And the stuff his dealer handled
Beat the M. O. by a mile.
For he said, "I'll tell you, neighbor,
When you want your money's worth,
You'll find you'll never get it
From 'the cheapest place on earth.'
"If you want to save your money,
Just remember this advice—
Every article that's honest
Is worth an honest price."

—DeLaval Monthly.

A PERSONAL NOTE.

To the Hub:

When fifteen years ago on November 28, 1895, Judge Kohlsaet, editor-owner of the then Chicago Times-Herald, asked me to act as referee in the first contest of self-propelled vehicles ever held anywhere in the world, he awakened in me an interest that has not abated for a single second since that memorable day.

My company has produced high-class wagons during the last forty years and automobiles during the last eight. To-day I present to you as a crowning effort of all these years of study and experimenting, a line of trucks and delivery wagons which I honestly believe to be without a compeer at anywhere near the prices asked and which I unhesitatingly recommend as the sturdiest, and most reliable vehicles in their respective classes, with a get-there-and-back ability, a durability, simplicity and efficiency second to none.

We are pioneers in solid tire cars and have turned out more than any other two manufacturers combined and I assure everyone that my factory and myself have kept abreast of the times and that to-day our product is vastly better than ever before.

It is my honest conviction, however, that in the 1911 line of McIntyre commercial cars I offer what I consider the greatest achievement of a life devoted exclusively to vehicle building and I honestly and truthfully recommend these models as the best



W. H. McIntyre, Ex-President, C. B. N. A.

cars my factory organization and myself can produce. I stand behind everyone of these cars. I know them and I wish the public to know them as I do.

I have concentrated my efforts on delivery wagons with a load capacity up to 2,500 pounds; I am convinced, and hundreds of pleased users agree with me, that McIntyre trucks are unexcelled.

I can furnish you any kind of a body suitable for your particular requirements. It would be a waste of time to refer at length to the advantages of a motor truck over a horse-drawn wagon. They are well known, but we want to emphasize the fact that McIntyre trucks and delivery wagons are the best McIntyre can produce, and that the best car McIntyre can build is the best car anyone can build at anywhere near McIntyre prices.

A McIntyre commercial wagon must be an investment that will pay heavy dividends and I want to be sure that it is an investment even at the risk of losing a sale.

Have the kindness to answer the following questions, and I will tell you frankly what I have to offer you that will exactly suit your requirements and I will prove to you an actual saving. If

your delivery service is such that McIntyre trucks are not advantageous to you, that you may need a heavier truck, I will not hesitate to tell you so.

How many wagons do you use?

How many teams do you use?

How many drivers and what is their approximate weekly payroll?

What was your expense account for delivery-service during the last year?

What was your veterinary bill?

How many miles does the average team cover daily?

What is the average load and what is the maximum load?

How are the roads? Any stiff hills to climb?



One of Three Factories Used Solely for the Manufacture of McIntyre Cars.

A full answer to these questions will enable me either to recommend to you a McIntyre model which is particularly well adapted to your needs or to admit frankly that I am not in a position to serve you profitably.

I prefer at present to confine myself to a line of trucks and delivery wagons with a load capacity up to 2500 pounds and to manufacture these right rather than have cars for all loads which may not give the most complete satisfaction to our customers.

For prices of bodies please see page fourteen.

I am willing to sell the chassis alone to wagon makers and they can attach their own bodies.

W. H. MCINTYRE, President W. H. McIntyre Company.

A VARNISH LIBRARY.

This month Valentine & Company suggest to readers that they cut the coupon in the lower right hand corner of their advertisement and mail it to them, that they may send, without cost, five booklets that have been most carefully prepared to explain the unusual varnish properties of the Vanadium line.

These booklets save time, because in a few words they really tell something all painters will find it profitable to know. The difficulties of automobile finishing are smoothed out. If they serve no other purpose, they will post the painter on a grade of varnish that is actually a new departure; and thinking men will welcome this.

In the strife for business no point can be overlooked by the careful, progressive man, and in these booklets a plain statement is put before him that assembles the facts before his judgment as the juryman whose verdict shall decide.

VEHICLE MEN FUN-MAKING.

The Vehicle workers of Flint, Mich., will hold their annual excursion and outing at Wenona Beach, Bay City, July 22, instead of Lake Orion, Decoration Day, as previously reported.

Trade News From Near and Far

BUSINESS CHANGES.

Superior Buggy Loop Co., Upper Sandusky, O., decreased its capital from \$25,000 to \$12,500.

S. A. Harry, of Hoopeston, Ill., went to Gilman for the purpose of considering the proposition of removing the Hoopeston Carriage Company.

The Sycamore Wagon Works is to leave Sycamore, Ill., and move to DeKalb. The company has just finished building an addition to its plant and no thought of its removal has been entertained.

With the sale of the carriage business of Eugene Ford, Rockford Ill., to J. E. Calkins, and E. R. Blair there passes to new ownership one of the oldest manufacturing institutions in that city. Mr. Ford has retired.

One of the largest deals made in Charleston, Ill., was consummated when Walter Wheatley purchased a half interest in the business of the Charleston Mercantile Company. The firm deals in buggies, implements and general hardware.

The Federal Rubber Company, Cudahy, Wis., will be succeeded by the Federal Rubber Manufacturing Company, which was incorporated at Madison with a capital of \$1,000,000. The officers of the old company, John H. Frank, president; William H. Upmeyer, vice-president, and William C. Brumder, secretary, will not be interested in the new company, they having sold their interests to eastern men. The names of the incorporators are John W. McMillan, J. G. Hardgrove and Garfield S. Canright. The Federal Rubber Company a little more than a year ago succeeded the Milwaukee Rubber Works, in which William Becker of Milwaukee was interested.

A. E. Thompson, who has been manager of the Studebaker Bros. Company, of Minnesota, for the past year and a half, has tendered his resignation, to take effect as soon as his successor is appointed. Mr. Thompson has an enormous capacity for work, but has been overdoing it since he accepted his present position, and feels that it is necessary for the sake of his health to take a rest and relieve himself of the burden and worry of business. His plan is to get entirely away from work for the balance of the summer, believing that he will be in better condition in the fall to take up some other proposition. He has made no definite plans for the future, except that the summer will be for him one long vacation.

NEW FIRMS AND INCORPORATIONS.

Williams Wagon Works, Macon, Ia., incorporated with a capital of \$12,000.

J. H. Upham has opened a carriage and automobile painting shop at Waukegan, Ill.

A. P. Heyer Co., Montclair, N. J., to manufacture motor cars, etc., capital \$50,000, has been incorporated by A. P. Heyer, G. D. Smith.

Circle Motor Car Co., to manufacture motor vehicles, etc., capital \$25,000, incorporated by J. J. Boyle, E. M. Boyle, New York City.

Racine (Wis.) Automobile & Motor Works, has been incorporated, capital \$5,000, by Soren Peterson, Jens Mikkelsen, Geo. Gammelgaard.

Elmer Auto Corporation, Elkhart, Ind., manufacturers, incorporated, capital \$700,000, by H. H. Elmer, H. H. Murden, J. P. O'Shaughnessy.

The American Automobile Manufacturing Company, of Arizona, capital stock \$1,000,000, has been certified to in Indiana for

\$300,000. The directors are H. K. Cole, Powell McRoberts and A. C. Davis; office at New Albany.

H. G. Kennedy Motor Truck and Wagon Co., incorporated, capital \$30,000, by H. G. Kennedy, Geo. W. Farlin, C. F. Bryant, at Seattle, Wash.

The Olympia Mfg. & Service Co., Jersey City, N. J., to manufacture automobiles, capital \$100,000, has been incorporated by H. Schmidt, R. Segelken.

Wentworth Mfg. Co., Detroit, Mich., to manufacture auto parts, capital \$10,000, incorporated by Eugene N. Wentworth and A. Hedman, of Detroit, and others.

The Stephenson Motor Truck Company, Milwaukee, Wis.; capital \$300,000, has been incorporated by A. E. Halderman, H. F. Friedrich and Paul D. Durant.

The Ewing American Motor Co. has been incorporated at Ulster, N. Y., to manufacture and deal in automobiles, capital \$1,500,000 by C. A. Hamlin, A. P. Anderson.

Motor Finance Co., New York, to manufacture and deal in accessories and motor vehicles, etc., capital \$100,000, has been incorporated by H. S. Flynn and S. Friedlander.

Wm. W. Hawkins Engineering Co., to manufacture, deal in, repair and store automobiles, motors, etc., capital \$25,000, incorporated by P. J. McDonald, A. Bernardik, New York.

Automobile Radiator and Parts Manufacturing Company, Chicago, Ill., capital \$2,400; automobiles, trucks and parts, has been incorporated by Elmer W. Adkinson, John P. Wolf, Alice Culp.

Ohio Auto Accessory Co., Columbus, O., capital \$30,000, to manufacture and deal in accessories for automobiles and other motor vehicles, has been incorporated by W. C. Weatherbolt and Nathan Myer.

An automobile factory is to be built on Laclede avenue, St. Louis, by the Dorris Motor Car Company. A plot 200 feet front on Laclede, south frontage, beginning 100 feet west of Sarah street, was acquired by the Dorris Company to add to the corner parcel at Sarah Street, which H. B. Krenning, president of the Dorris Company, owns. This gives them 300 feet on Laclede and 200 feet on Forest Park Boulevard.

IMPROVEMENTS—EXTENSIONS.

The Booth Demountable Rim Co., Cleveland, O., increased its capital from \$10,000 to \$200,000.

The capital stock of the Selma (Ala.) Spoke Manufacturing Company was increased from \$10,000 to \$25,000. The company was organized a year ago and has been growing rapidly.

C. B. McKenzie, the Walter Box Company, Houston, Texas, is opening a stock of carriages, harness and accessories at Taylor, Texas. The box company also operates stores in Georgetown and Waco.

FIRE.

Fire did \$50,000 damage and destroyed ten motor cars at Detroit at the garage of the Carhartt Automobile Co. The three-story brick building was gutted.

J. M. Bibee's blacksmith shop and vehicle, harness and implement house at Carthage, Mo., was practically consumed by fire.

BUSINESS TROUBLES.

Benjamin Strauss and Robert Kennedy, both of Hamilton, O., have been named receivers under bond of \$150,000, for the Columbia Carriage Company of Hamilton. Thomas L. Curley,

president and manager, petitioned the court for receivers on the ground that irreconcilable differences had arisen among stockholders.

The story of the old Ionia (Mich.) Wagon Works is being retold in the Circuit Court. The case of John Thwaites and Fred A. Chapman against John F. Bible and Chauncey J. Rumsey for damages was started. Fraud is charged in the sale of \$25,000 worth of wagon works stock to Thwaites and Chapman.

Oscar B. Knight took possession of the assets of the Dundee (Ill.) Manufacturing Company at the wagon works in Dundee, as receiver, appointed by Judge Carpenter in the United States court in Chicago, and he installed H. E. Kingsley as his custodian. Mr. Knight was appointed on the petition of W. A. Paulsen.

GOING AHEAD RAPIDLY.

Owing to the large increase in the business of the Ohio Motor Car Company, they have applied to the Secretary of State for an increase of capital to \$450,000.00, \$250,000.00 being common stock and \$200,000.00 being preferred stock. This speaks well for the Ohio car which is making its way rapidly in public favor. The remarkable work which it has performed in the last few months has entitled it to a place in the foremost ranks among the highest type of motor cars.

It is claimed by some of the best experts that the motor used in the Ohio will take a larger charge of gas and deliver more power than any other motor of its size. This motor is built by the Ohio Motor Car Co in their own factory. The Ohio is not an assembled car, but is built throughout in the factory of the Ohio Motor Car Co.

MECHANICAL HINTS.

Perhaps the latest method of keeping machines free from dust, shavings, etc., is the use of a hose connected to a compressed air tank. The compressor is usually in the boiler room, and from it pipes lead to all departments of the plant where machines are used. A hose connected to one end of these pipes enables the machine operator to quickly blow all accumulation out of his machine; he can introduce the nozzle into every part, cleaning even delicate parts without touching them, reaching places that cannot be very well reached otherwise.

MOLD AND INSULATION.

Rubber insulation is ruined by the action of mold. Moisture has little effect.

FORGET IT.

If you've made a grave mistake—
One you didn't mean to make,
—Just—forget it!
Don't let it cause you pain,
Just don't make the same again,
—And—forget it!
There are many more like you
Who have done the same thing, too,
—So—forget it!
There's a future in this w
And to those it is unfurled
—Who—forget it!
So buckle up your mind,
And encouragement you'll find
—To—forget it!
Make up your mind "to dare and do,"
And good things will come to you;
—So—forget it!
—New York American.

OBITUARY

Henry H. Van Brunt, aged 63 years, head of the Van Brunt Automobile Company, and one of the most prominent business men of Council Bluffs, Ia., died May 6 of heart trouble, after an illness of a week. He located in Council Bluffs in 1868 and was one of the pioneer buggy, wagon and automobile dealers of the west. He has held a number of public offices and positions of trust in his city.

RECENTLY EXPIRED PATENTS OF INTEREST TO THE VEHICLE INDUSTRY.

Patents Expired April 10, 1911.

517,988—Vehicle. Charles H. Stratton, Buffalo, N. Y.
517,996—Automatic Vehicle Brake. Herbert L. Bailey, Chicago, Ill.

Patents Expired April 17, 1911.

518,229—Pneumatic Tire for Wheels. Thomas A. Egan, Jersey City, N. J.
518,376—Vehicle Cover and Support Therefor. John H. Rau, Cincinnati, O.
518,393—Thrust Bearing for Wheels, Etc. James S. Chace, Brockton, Mass.
518,395—Device for Packing Vehicle Wheels. Francis G. Davis, Wauertown, N. Y.

Patents Expired April 24, 1911.

518,627—Spoke Attachment for Vehicle Wheels. Louis Rastetter, Fort Wayne, Ind.
518,688—Fifth Wheel for Vehicles. Robert Carr, Newburg, N. Y.
518,736—Wheel. George P. Hobbs and Alonzo L. Edwards, Wheeling, W. Va.
518,772—Horseshoe. Frederick W. Bach, New York, N. Y.
518,928—Vehicle Brake. John F. Shepard, Jackson, Mich.

Patents Expired May 1, 1911.

518,951—Hub Protector for Vehicles. Nelson D. Hodgkins, Marquette, Mich.
519,177—Wheel Tire. Harry M. Devoe, New York, N. Y.
519,249—Tire Marker. Oscar F. Farwell, Woodstock, Vt.

The above list of patents, trade marks of interest to our patrons are furnished by Davis & Davis, solicitors of American and foreign patents, Washington, D. C., and St. Paul Building, New York City.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word. Initials and figures count as words. Minimum price, 30 cents for each advertisement.

POSITION WANTED.

Wanted—Position as trimmer foreman. Experienced man on vehicle trimming of all kinds, auto tops a specialty. Address C. C., care The Hub, 24 Murray street, New York.

HELP WANTED.

Wanted—Permanent position for a man who is a first-class strapper and leatherer on high grade pleasure and commercial electric automobiles. Call in person or write us. The Waverly Co., Indianapolis, Ind.

Wanted—Painter for truck and bus work, must be good letterer and first class painter. Fifty cents an hour, steady work, no labor trouble. Address B. F., 96 care The Hub, 24 Murray street, New York City.

Wanted—First class finisher on coupe and commercial electric automobiles. Call in person or address the Waverly Company, Indianapolis, Ind.

AGENTS WANTED.

Wanted—Salesman to sell business wagons—a good live real salesman—not merely a traveling man—exclusively delivery wagons of excellent reputation. Address M. G., care The Hub, 24 Murray street, New York.

Wanted—Agents to handle side line of cutters, light bobs, runner attachments and cutter gears on commission. Kalamazoo Cutter & Sleigh Co., Kalamazoo, Mich.

PATENTS.

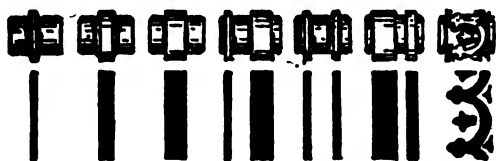
Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.



Painters and
Decorators Save Time, Labor
and Money, using the

Uebelmesser Striping and Stencil Wheel

With this simple, clean and rapid-action tool the most ordinary decorator can do the finest striping and stencil work and produce a bigger day's work with less labor than by the old fashioned method. Complete directions are furnished with each tool. They are as simple as the tool itself.



Just a few of the many designs that can be produced with the Uebelmesser Painters' and Decorators' Tool. (The designs shown above are reduced in size)

Complete Outfit consisting
of Machine, 10 Plain and 10
Ornamental Wheels, only... **\$5.50**
LIBERAL DISCOUNT TO THE TRADE

Manufactured by

Charles R. Uebelmesser Company
Bayside, New York, N. Y.

INDEX TO ADVERTISEMENTS.

Ault & Wiborg Co., The	6
Bailey & Co., Inc., S. R.	18
Barbour Steel Tire Co.	4th cover
Bokop, Webb & Palm	12
Columbus Bolt Works	4th cover
Consolidated Rubber Tire Co.	2nd cover
Crane & MacMahon	2nd cover
Decker, J. C.	3rd cover
Devoe, F. W., & Raynolds Co., C. T.	3rd cover
Eccles Co., Richard	12
Enterprise Foundry, The	11
Frost Gear & Machine Co.	12
Gerhab, Jacob	4
Gifford & Son, John A.	12
Goodrich Co., B. F., The	5
Goshen Eyelet Co.	18
Gramm Motor Car Co., The	3rd cover
Higgin Mfg. Co.	14
Hoopes Bros. & Darlington, Inc.	2nd cover
Hotel Latham	2
Jones & Co., Phineas	3-4
Keystone Paint & Filler Co.	4
Koller Co., J. B.	3rd cover
Masury & Son, John W.	2
Mayo Radiator Co.	4
Metropolitan Lamp Co.	18
McKinnon Dash Co.	4th cover
McIntyre Co., The W. H.	14-15
Moller & Schumann Co.	3
Moore & Co., Benjamin	4
National Association of Manufacturers	13
New Wapakoneta Wheel Co., The	1
Oliver Typewriter Co.	18
Payne Co., E. Scott	18
Porter, H. K.	12
Reilly, John, Inc.	2
Russell, Burdsall & Ward Bolt and Nut Co.	3rd cover
Standard Automatic Mfg. Co.	17
Standard Oil Cloth Co.	4th cover
Timken Roller Bearing Co.	1
Uebelmesser Co., Charles R.	11
United Rim Co.	6
Valentine & Company	3
West Tire Setter Co.	3
Wiggers Furniture Co.	4th cover
Wilcox Mfg. Co., D.	16
Wiley Co., C. A.	4
Woodman, Joel H.	18

Burlington Rubber Tire Machine



Our big No. 4 is the only machine made that will apply all kinds of solid and cushion rubber tires both internal and outside wires and close the joint on the same machine. One man can operate the machine easily without help. Put an end to your troubles in applying tires by investing in this machine. Write for descriptive circulars and price.

THE ENTERPRISE FOUNDRY
HARVEY, ILL., U. S. A.

Please mention "The Hub" when you write.

GEARS

Our gears are theoretically correct, and give the maximum amount of satisfaction.

Are you enjoying this BEST service?

If not, INVESTIGATE! NOW!

FROST GEAR & MACHINE CO.
JACKSON, MICH.



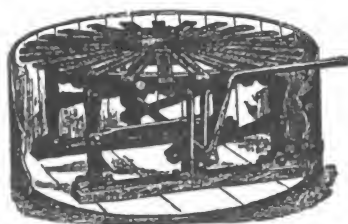
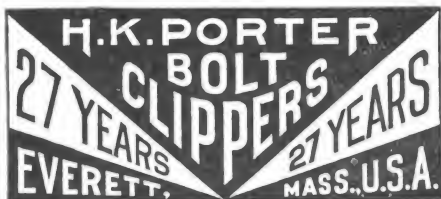
ESTABLISHED 1886.

Correspondence School of Carriage and Motor Carriage Drafting

A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

Principal, THOS. MATTISON,
Hillside Avenue, Bitterne Park,
Southampton, England.

Author of "The Coach Body Makers' Guide," \$3.00; a practical treatise on "The Suspension of Carriages," "Bookkeeping," and other carriage building works.



The Bokop Tire Setter and Cooler
Is the Best and Only Machine that has stood the test during the last 12 years on all classes of work, and is the Only Machine built with the indestructible Wrought Iron Face Plate. Over 1,000 are in successful operation, repairs on which have not exceeded \$6.00 in the last 12 years. For prices, references and descriptive circulars, address **BOKOP, WEBB & PALM,** Defiance, Ohio.

Please mention "The Hub" when you write.

Advertisements Classified

The following list includes advertisers in THE HUB. Each advertiser is entitled to name under one heady only. An extra charge for name under more than one heading.

Axles

American Ball Bearing Co., Cleveland, Ohio.
Keagy & Lear Machine Co., Coshoccon, Ohio.
Timken Roller Bearing Co., Canton, Ohio.

Automobile Radiators

Mayo Radiator Co., New Haven, Conn.

Bodies, Seats, Etc.

Kilvington, S. W., Wilmington, Del.
Wiggers Furniture Co., The, Cincinnati, Ohio.
Woodman, Joel H., Hoboken, New Jersey.

Bolts and Nuts

Columbus Bolt Works, Columbus, Ohio.
Russell, Burdall & Ward Bolt and Nut Co., Port Chester, N. Y.

Carriage Forgings.

Columbus Bolt Works, Columbus, Ohio.
Eccles Co., Richard, Auburn, N. Y.
Indiana Forging Co., Indianapolis, Ind.

Carriage Hardware.

Gifford & Son, John A., New York.
Ochsner & Sons Co., A., New Haven, Conn.
Payne Co., E. Scott, Baltimore, Md.

Carriage Goods

Gifford & Son, John A., New York.
Higgin Mfg. Co., Newport, Ky.
Dashes, Fenders, Rails, Etc.

Bennett Mfg. Co., Alden, N.Y.
McKinnon Dash Co., Buffalo, N. Y.

Fifth Wheels

American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.
Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Finished Vehicles

Bailey & Co., Inc., S.R., Amesbury, Mass.

Gear Irons

Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Gear Woods

Andrew Kimble, Zanesville, O.

Lamps

Gifford & Son, John A., New York.

Leather

Nelson, A. T. A., Co., Cincinnati, Ohio.
Reilly, John, Inc., Newark, N.J.

Lubricating Device

Aden Mfg. Co., Dansville, Va.

Motor Trucks

Gramm Motor Car Co., The Lima, Ohio.

Machinery and Tools

Bokop, Webb & Palm, Defiance, Ohio.
Enterprise Foundry, The, Harvey, Ill.
Porter, H. K., Everett, Mass.
Standard Automatic Mfg. Co., New York.
West Tire Setter Co., Rochester, N. Y.

Miscellaneous

Goshen Eyelet Co., Goshen, Ind.
Standard Oil Cloth Co., New York.
Uebelmesser Co., Charles R. Bayside, New York.

Rubber Tires

Consolidated Rubber Tire Co., New York City.
Goodrich Co., B. F., Akron, O.

Rims

United Rim Co., Akron, Ohio.

Shaft Couplings and Anti-Rattlers

Eccles Co., Richard, Auburn, N. Y.
Metal Stamping Co., New York City.
Steel Socket Shaft End Co., Cleveland, Ohio.

Spark Plugs

Ball Multi-Spark Plug Co., Minneapolis, Minn.

Springs and Gears.

Keystone Spring Works, Inc., Philadelphia, Pa.
Spring Perch Co., Bridgeport, Conn.

Varnishes, Paints and Japans

The Ault & Wiborg Co., Cincinnati, Ohio.
Devos, F. W., and C. T. Raynolds Co., New York City.
Masury & Son, John W., New York and Chicago.
Moller & Schumann, Brooklyn, N. Y.
Murphy Varnish Co., Newark, N. J.
Valentine & Co., New York, Chicago, Boston, Paris.
Wiley Co., C. A., Hunter's Pt., New York City.

Wheels

Crane & MacMahon, New York
Gifford & Son, John A., New York.
Hoopes Bro. & Darlington, West Chester, Pa.
Jones & Co., Phineas, Newark, N. J.
New Wapakoneta Wheel Co., Wapakoneta, Ohio.
Standard Wheel Co., Terre Haute, Ind.

Wheel Stock, Bent Wood, Etc.

Crane & MacMahon, New York

Richard Eccles Co., Auburn N. Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile, Special

Send for Catalogue.

Which is more perilous
—farming or metal
working?

In occupational injury
where does the
average of fault lie?

What nation sets the
standard in
accident prevention?

On what day
of the week
do the
most accidents
occur?

How much
of the compen-
satory
award
reaches the in-
jured workman?

What relief
system does
most
for indus-
trial efficiency?

Who are more
subject to
accident—
male or fe-
male workers?

Why are New
York accident
rates many
liability
times those
of Germany?

How can
American
liability
methods be
improved?

What are the
defects
of the English
system?

How can our
annual roll of
over
1,000,000
casualties be
reduced?

What propor-
tion of the
insurance
should the
employer bear?

What did
10,000 manu-
facturers
say of our
present liability
system?

AN EPOCH MARKING WORK!

ACCIDENT PREVENTION AND RELIEF

An investigation of the subject in Europe, with special attention to England and Germany, together with recommendations for action in the United States.

By **Ferd. C. Schwedtman and James A. Emery**

For the National Association of Manufacturers

BASIC facts underlying the whole subject of industrial accidents; the principles of accident prevention; equitable systems of compensatory awards, are embodied in this exhaustive analysis of industrial employments with regard to the safety of the individual, the conservation of human life and the welfare of the State.

A BOOK OF THE UTMOST VALUE

For the Employer, the Workman and the Legislator

CONTENTS

Chapter I. Outline and Underlying Principles of European Compensation Legislation.

Chapter II. Underlying Principles and General Working of the German Scheme of Compensation for Occupational Accidents.

Chapter III. Detailed Description of Some of the Important Features of the German System—Efficiency, Prompt and Proper Medical Aid, the "Doctor Question," the Contributory Principle.

Chapter IV. Obligatory Insurance An Important Factor in Accident Compensation—Various Forms of Insurance, Mutual Insurance, Statistics, Scientific Inspection, Litigation.

Chapter V. Hazardous Occupations—Comparative Hazard of Industry and Farm.

Chapter VI. Prevention of Accidents, Cause and Cure of Injuries, European Safety Museum (Accident Prevention Institutions).

Chapter VII. Cost of Accident Compensation Insurance in Germany in Compari-

son with similar rates in the United States.

Chapter VIII. Employers' Liability in Great Britain Prior to the Compensation Acts.

Chapter IX. The Introduction of the Compensation Principle by the Acts of 1897 and 1900, and the Investigation of the Operation of this Legislation by the Departmental Committee of 1904.

Chapter X. The Final Extension of the Compensation Principle. The Act of 1906. Outline of Its Provisions and Examination of the Nature and Extent of Its Liabilities.

Chapter XI. British Compensation Statistics. The Neglect to Record the Operation of the Earlier Acts Incompletely Remedied by Partial Information Required Concerning the Act of 1906.

Chapter XII. Insurance under the Compensation Acts.

Chapter XIII. Primal Defects of the British Legislation.

Chapter XIV. Finding and Recommendations of the Committee.

APPENDIX.

Copiously illustrated with half tones, charts, and diagrams in color

Prices: Half Morocco [de luxe edition], \$15; Cloth \$10

ADDRESS

THE NATIONAL ASSOCIATION OF MANUFACTURERS

Terminal Building 30 CHURCH STREET, NEW YORK CITY

What is total disability
as applied to the injured
worker?

How can the "ambu-
lance chasing" practi-
tioner be eliminated?



The Greatest Advertising Campaign Ever Used in the Sale of an Automobile Truck

All advertising to be done over the name of the
local dealer in his home paper

McIntyre

\$1350

Commercial Power Wagon



If, we repeat, if you are a live up-to-date dealer and have the facilities and ability to sell the greatest commercial power wagon ever built, you should immediately get into touch, by wire, 'phone or letter, or in person, with our Sales Department. We are inaugurating an advertising campaign which, for effectiveness, will be unique in the annals of the commercial power wagon. We propose to advertise the McINTYRE Commercial Power Wagon over the name of the dealer in the newspapers of the town in which the dealer lives and does business. We propose, by this method, to get live, up-to-date inquiries from those who are interested in power wagons, so that the dealer can follow them up direct. **This means big business for McINTYRE dealers;** Your advertisement, appearing in your local newspaper, goes into the hands of your local business people and will be read by them, and all inquiries will go to you direct.

The advertisements for this special newspaper campaign have been prepared by one of the largest advertising agencies in the country—a concern that has had a lot of experience in producing effective copy.

This is one of the greatest opportunities ever offered to power wagon dealers.

Act at once! Send in the coupon **now**—before you lay aside this publication. Full particulars will be sent by return mail.

W. H. McINTYRE CO.

AUBURN, INDIANA

Please mention "The Hub" when you write.

\$1350

*McIntyre***Commercial Power Wagon**

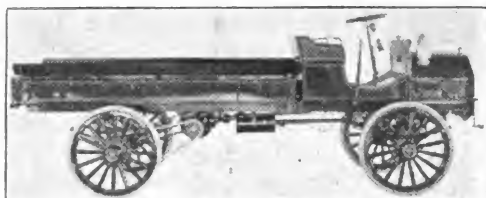
The McINTYRE Commercial Power Wagon has proved its adaptability to every commercial need. It has been aptly called "The World's Greatest Power Wagon" and is making good wherever it is in service. There has never been a commercial power wagon made that—price considered—could compare with the McINTYRE.

On account of the popularity and increased sale of our power wagons, we have increased our manufacturing facilities and are in a position to consider applications on the part of live, up-to-date dealers. First come, first served.

Investigate the McINTYRE Heavy Duty Motor with the automatic governor, which absolutely prevents overspeeding—the source of 90 per cent. of all motor truck troubles. Note the following specifications and then write for further particulars.

Capacity—2,000 pounds.	Stroke—4¾.
Wheel Base—119 inches.	Mileage capacity per gal.—12 to 15 miles.
Tires—Solid rubber, 2½ inches.	Ignition—Dual system, magneto and dry cells.
Horsepower—24.	Equipment—3 oil lamps, horn, tools and jack.
Cooling—Water-cooled.	Net Weight—2,200 pounds.
Speeds—2 speeds forward, 1 reverse; 4 to 12 miles an hour.	
Bore—5¼.	

The Owner, not the driver controls the speed. Built for hard service.



The Motor Truck that will positively "stand up" under any and all conditions, and the whole guaranteed to come up to specifications.

W. H. McINTYRE CO.
AUBURN, INDIANA



**WE
SELL
THE
CHASSIS
TO
WAGON
MAKERS**

New York
Galveston
GALVESTON, TEXAS, WEDNESDAY
AME
Baltimore
ONLY NEW
DAY
VOL. XXV No. 162
SEA
South
SOUTH BEND, INDIANA, THURSDAY
THE HERALD
SALT LAKE
ST. JOSEPH
Topeka
TOPEKA, KANSAS
ST. LOUIS
ST. LOUIS, WEDNESDAY
San Francisco
KNOX
KNOXVILLE, TENN., THURSDAY
Milwaukee
Montgomery
MONTGOMERY, ALABAMA
PEORIA
CHATTANOOGA
Register
CHATTANOOGA, TENN., FRIDAY MORNING

Price, \$1.35
Opportunity
McIntyre
Commercial Power Wagon
Specifications Model No. 14
Dealer's Name

Price, \$1,350
To the Man Who Pays the Bills
Just a Thought for the Day—the McIntyre Commercial Power Wagon
Has been successfully adopted by some of the largest manufacturers in America (and some foreign countries). As a business man you are under constant obligation to yourself and to your business to make "profits" by saving money in the operation of your business.
A request will bring our commercial car expert to your door. He will show you some "tricks" in your business that can be mapped.
McIntyre heavy duty Motor
It is a "break" in the "chain" and the driver controls the speed. The automatic governor absolutely prevents overspeeding—the source of 90 per cent. of all motor truck troubles. The McIntyre heavy duty motor is built for hard service.
Specifications Model No. 14
Price, \$1,350
Dealer's Name
"There's a place in your business for us."

COUPON.

W. H. McINTYRE CO.,
Auburn, Ind

Gentlemen:

Please send full particulars regarding your national newspaper campaign, advertising your commercial power wagon over the dealer's name.

Name

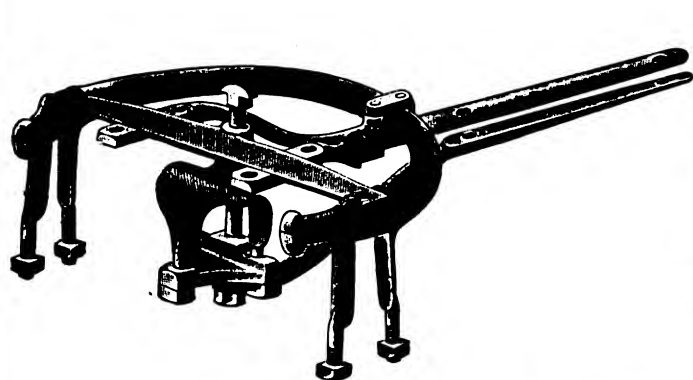
Address

City

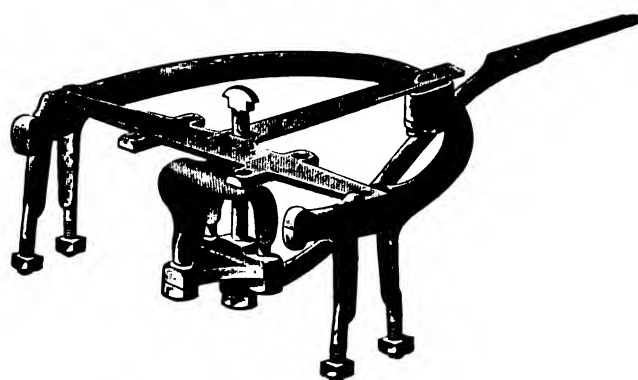
State (Hub)

Please mention "The Hub" when you write.

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



No. 1908—Gear Iron



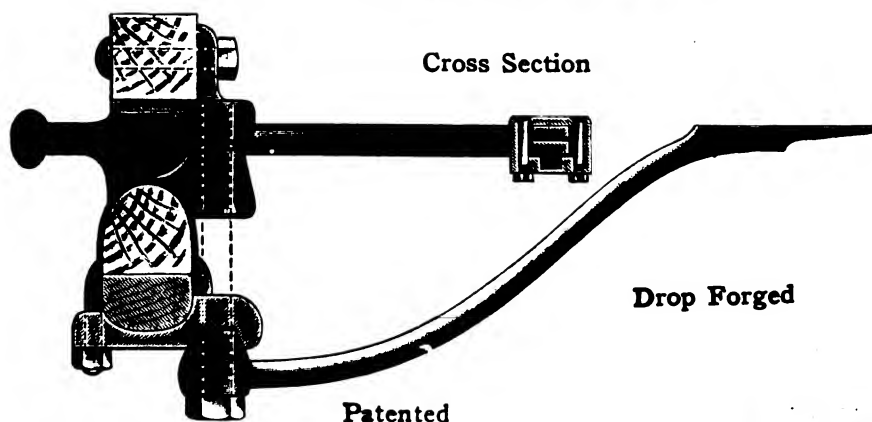
No. 2000—Gear Iron

WILCOX'S

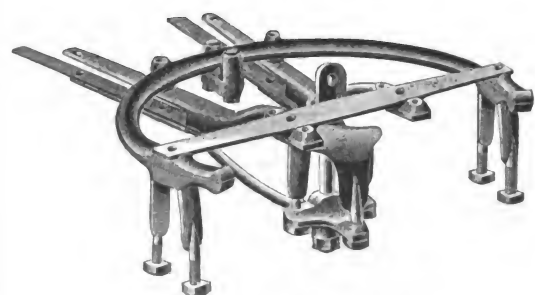
Mechanical

3 Prong King Bolt

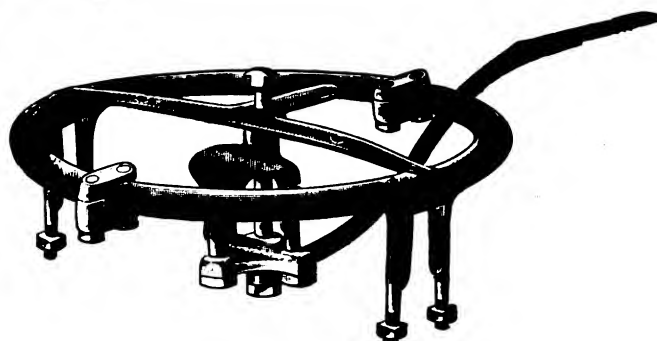
Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.



SURE
SAFE



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

The Standard Automatic Brush

Does your painting work in a New Way—better, quicker, cheaper, eliminating all waste of paint. An equal flow at all times: thickness of coat can be accurately adjusted. Absolutely clean and fireproof.

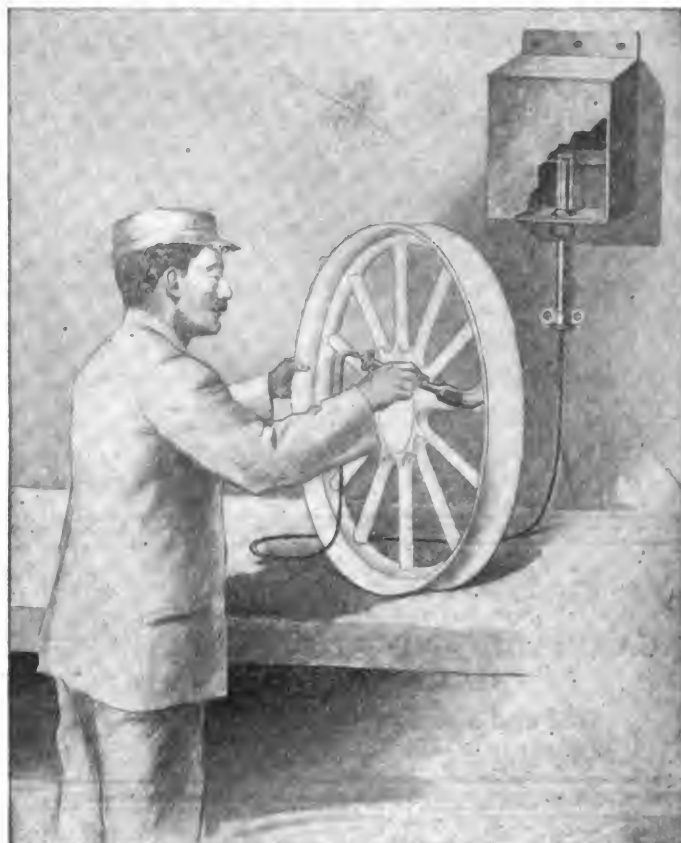
**Jobbers
and
Dealers
Wanted
Every-
where**

Complete Outfit

Consisting of a large paint tank, either stationary or movable, with automatic valve and six feet of flexible tubing, together with the automatic adjustable brush, made of aluminum,

Costs \$7.50

and it is still cheaper than the ordinary brush. The outfit is also made with a tank to be strapped on the back, which will cost \$2.50 extra.



The Standard Automatic System Does Away with the Paint Can

It eliminates the dip and is far superior to the spray, but it does rub it in. No air pressure is needed. Will work with any kind of paint. **GET NEXT TO THIS NEW METHOD.** Made especially for manufacturers of automobiles, automobile bodies and wheels, all kinds of vehicles, carriages, etc.

Wherever duplication of work exists, this device will increase your output and reduce the cost. Buy just one outfit to-day and be convinced. We are sure that we will have to equip your entire plant.

OUR LITTLE BOOKLET WILL TELL YOU WHY.

Write for one to-day. Send in your order. Your outlay will only be once. Apparatus will last a lifetime. Special equipments can be made to suit your purpose. Let us know what you are manufacturing and we will effect a saving for you.

Standard Automatic Mfg. Co.

50 CHURCH STREET, NEW YORK



Carriage Mechanics

Desiring to improve their present
Condition should attend the

TECHNICAL SCHOOL

FOR

Carriage Draftsmen and Mechanics

SUPPORTED BY THE

Carriage Builders' National Ass'n.

The object of the School is to teach men to design vehicles and make working drawings, and to otherwise facilitate their work in the shop. Only those men employed in carriage or automobile building or their accessory trades are admitted to its privileges.

The classes are conducted in three divisions, viz.: Corresponding, Day, and Evening. The former is open during the entire year, while the day and evening classes are in session only from October 1st to April 1st.

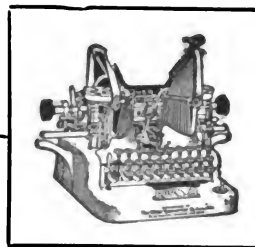
The tuition is moderate.

For prospectus and full particulars, write to the instructor,

ANDREW F. JOHNSON,

18 West Forty-fourth St.,

NEW YORK CITY.



17 Cents a Day Buys

The **OLIVER**

Typewriter

The Standard Visible Writer

Can you spend 17 cents a day to better advantage than in the purchase of this wonderful machine?

THE OLIVER TYPEWRITER CO.

310 Broadway, NEW YORK, N. Y.

E. SCOTT PAYNE CO.

OF BALTIMORE CITY

CARRIAGE AND AUTOMOBILE HARDWARE

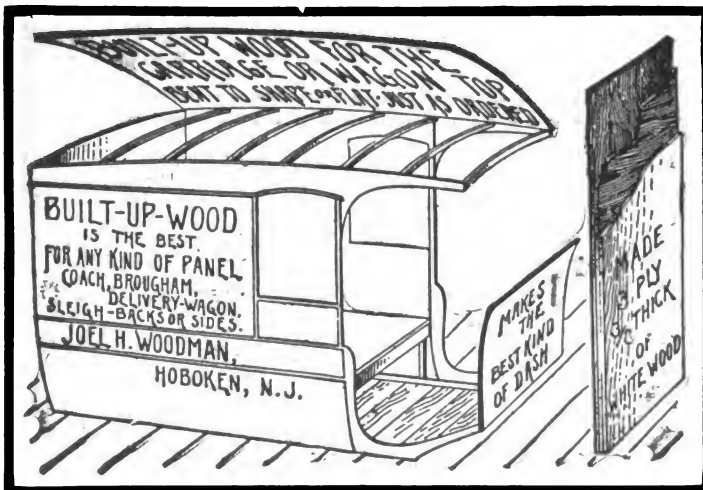
362 and 364 North Gay Street,
BALTIMORE, MD.

S. R. BAILEY & COMPANY, Inc.

Makers of the Celebrated.

WHALEBONE ROAD WAGON

AMESBURY, MASS.



Goshen Eyelet Co.

Manufacturers of

Carriage Top Trimmings

GOSHEN, INDIANA

H. WEICHHOLD

L. D. Phone 2290-W Market

METROPOLITAN LAMP COMPANY

Manufacturing and Repairing of

AUTOMOBILE SEARCH and SIDE LIGHTS, COACH and CARRIAGE LAMPS

Makers of All Kinds of Metal Goods.

Nickle and Silver Plating

24 Mechanic Street,

Newark, N. J.

Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

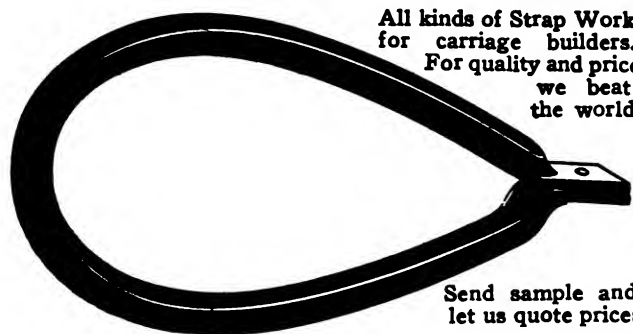
F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES



All kinds of Strap Work
for carriage builders.
For quality and price
we beat
the world.

Send sample and
let us quote prices

J. C. DECKER :

Montgomery. Pa.

J. B. KOLLER & COMPANY

Manufacturers of

FINISHED SPOKES

All Sizes for

SARVAN, WARNER, SHELL BAND AND
WOOD HUB WHEELS.

HICKORY and OAK BENT RIMS

Mechanicsburg,

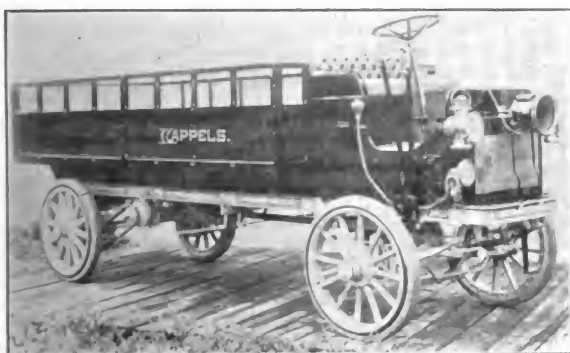
Pennsylvania



BOLTS Rivets, Carriage Makers' Washers
and Burrs for all kinds of Vehicles
Russell, Burdsall & Ward Bolt and Nut Co.

Main Works, PORT CHESTER, N. Y.

Branch at Rock Falls, Ill.



The GRAMM Was a Success Before Other Commercial Cars Came Into Existence

Ask any well posted man to tell you what commercial cars were prominent when the really great American pleasure cars were first making history. "Well," he will say, "there was the Gramm ——" And there he will stop. He knows the Gramm because a decade ago B. A. Gramm had marked out the way for other successful trucks to follow. The Gramm was a notable, practical achievement long before competing commercial cars came into being. Those years of extraordinary experience are the Gramm's greatest asset; no truck buyer can close his

eyes to the fact that other trucks must pass slowly through the same trying period of development. Wherever the Gramm has entered into a contest with other trucks, the value of that long experience in truck building was made clear. The Gramm has not only made repeated perfect road and technical scores when handicapped with overloads, but IT WAS ALWAYS READY TO REPEAT ITS SUPERB PERFORMANCE. In addition to the Gramm's efficiency, its marvelous records in economy tests offer the most powerful appeal possible to the shrewd truck buyer.

The Gramm is made in 1-ton, 2-ton, 3-ton and 5-ton models.

You must inevitably judge all other motor trucks by the Gramm.

THE GRAMM MOTOR CAR CO.,

107 South Lima Street, Lima, Ohio, U. S. A.

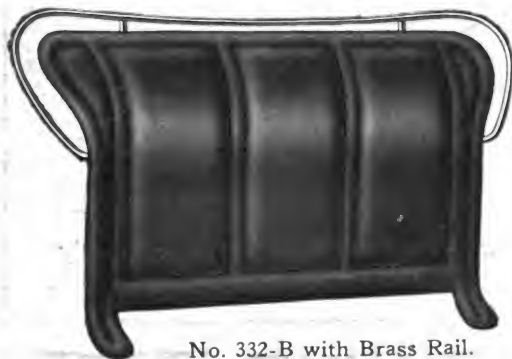
New York Headquarters: CROSS-MAGILL MOTOR TRUCK CO., 30 Church St., New York City. Let us send you our monthly "Gramm."

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



No. 332-B with Brass Rail.

A DASH RAIL

is as important a part of a dash as a
ROOF IS, OF A HOUSE

The Rail Protects the Top of the Dash

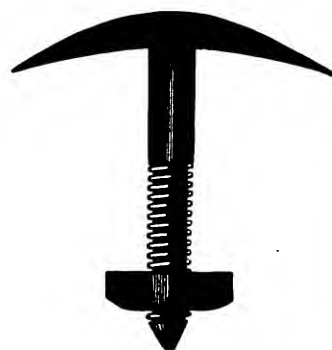
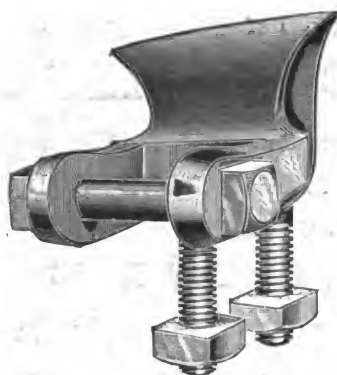
Skewed Shaft Couplings

Regular or Oval Patterns
For High Arched Axles

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



A. H. WIGGERS
Pres. and Mgr.

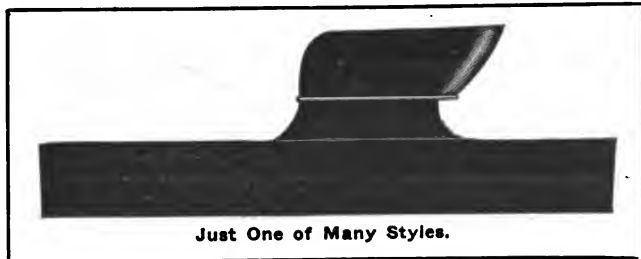
H. H. WIGGERS
Sec'y and Treas.

E. S. WIGGERS
Vice-Pres.

WIGGERS' BODIES

Automobile - Carriage

MERIT CONSIDERATION



Just One of Many Styles.

Because { THEY HAVE { Style
 { AND ARE { Quality
 { Symmetrical Outlines
 { Well Seasoned
 { Made to Wear
 { Priced Right

Address

The Wiggers Furniture Co.

Manufacturers of Carriage
and Auto Bodies and Seats

1417 to 1423 Plum St.

Cincinnati, Ohio

Meritas Leather Cloth

MERITAS
LEATHER
CLOTH

A low-priced leather substitute that not only looks well when new but will look well after months of hard wear.

MERITAS Leather Cloth has proved its title to the leading low-priced leather substitute. Built to wear—permanent finish. Made in muslin, duck and drill, dull and glazed, smooth and grained, black and colors for carriage trimming and auto accessories trade.

Look for trade-mark. At all jobbers.

Write us for sample book.

Standard Oil Cloth Co.
320 Broadway NEW YORK

The Hub



**AUTOMOBILES
CARRIAGES
MOTOR TRUCKS
WAGONS**



TRADE NEWS PUBLISHING CO
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN

STAR or KENNY

Sweet Concealed Band

WOOD HUB

WARNER

WHEELS

HEAVY and LIGHT

for

CARRIAGES

WAGONS and

TRUCKS

IF YOU WANT THE BEST TRY OURS



Load—Ten Tons of Coal.

SOLVED! Is the way motor car experts express themselves on the subject of tires for commercial motor vehicles after seeing and using the

KELLY-SPRINGFIELD SECTIONAL TIRE

With a grip on the road that means progress and security from the fault of solid tires—that of crowding the rubber ahead under load, which means disintegration—the motor wagon and truck owner will find in the Kelly-Springfield Sectional Tire the best tire for all heavy cars. Each section is dependent upon itself. If interested, write

CONSOLIDATED RUBBER TIRE COMPANY

New York, N. Y., and Akron, Ohio

Branches: Boston, Chicago, Philadelphia, St. Louis, Detroit, Cincinnati, San Francisco.



CRANE & MACMAHON,

(INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT,  ACORN,  and STAR  BRANDS OF

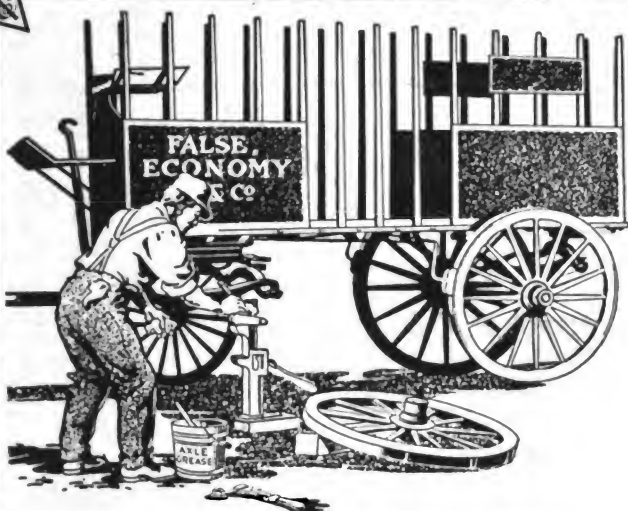
Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO.

RICHMOND, VA.

For Export Prices apply to the New York Office.



Oil Once a Month Instead of Dirty, Wasteful,
Twice-a-Week Greasing

TIMKEN ROLLER BEARING AXLES are guaranteed for two years by a big and responsible manufacturer -- they earn 200 to 300% a year on their cost.

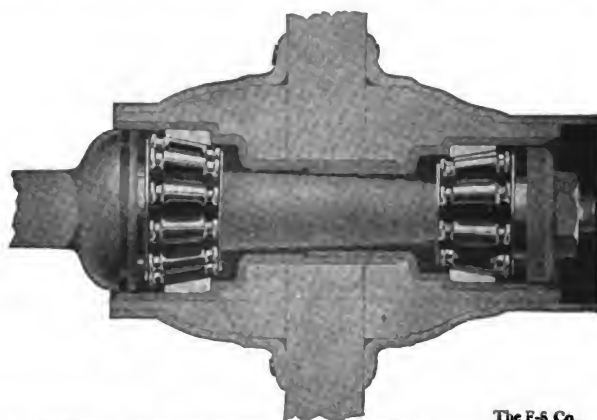
You push **TIMKEN ROLLER BEARING AXLES** for the profit you will get. Write today for **FACTS and FIGURES** -- for **CATALOGUE and PRICE LISTS**.

The Timken Roller Bearing Co.
CANTON, OHIO

There's More Profit For You in Wagons With **TIMKEN ROLLER BEARING AXLES**

than there is in ordinary wagons -- more profit in each sale and more sales.

TIMKEN ROLLER BEARING AXLES make pleased and enthusiastic customers and every wagon sold with them, sells another. Tell and show your customers how to **Reduce Draft 50%, Cut Feed, Shoeing, Harness Bills in Two.**



The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Please mention "The Hub" when you write.

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York, Chicago, Minneapolis, Kansas City

HOTEL LATHAM

5TH AV. AND 28TH ST.

NEW YORK

For Permanent and Transient Guests

One block from Madison Square Garden

EUROPEAN PLAN

Sample rooms for commercial men

Table d'Hote Luncheon, 50c

CLUB BREAKFAST, ALSO A LA CARTE

ROOMS WITH USE OF BATH, \$1.50 PER DAY

ROOMS WITH BATH, \$2. \$2.50 \$3. \$4. PER DAY

**A. L. PRATT
MANAGING DIRECTOR**

JOHN REILLY Inc.

Established 1865

MANUFACTURERS OF ALL GRADES OF

LEATHER

FOR THE

Carriage & Automobile Trade

PARTICULAR ATTENTION CALLED TO

OUR AUTO SPECIAL

FACTORIES,

**Avenues C & D, Murray & Astor Streets.
NEWARK, N. J.**

AGENTS,

**Cincinnati—National Hardware Co., Fourth Street
Detroit—C. W. Findlater, No. 313 Forest Ave., West**

Please mention "The Hub" when you write.

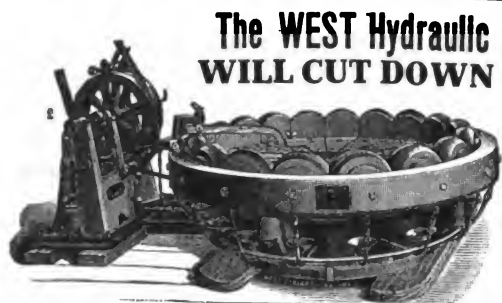
MOLLER & SCHUMANN COMPANY COLORED RUBBING

Most perfect as to working, drying and wearing.

CARRIAGE & AUTO VARNISHES

Send for color card and descriptive price list.

Chicago Branch - 110 N. Desplaines St., Office and Factory - BROOKLYN, N. Y.



The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE

Tires set cold in one minute. This machine saves time — does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim and

thus make the tire loosen prematurely. Saves re-sandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO., ROCHESTER, NEW YORK

Jones Wheels BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.
Newark, N. J.

5 FREE BOOKLETS

VALUABLE TO YOU
IF YOU ARE INTERESTED IN

Automobile AND Carriage Painting



A small library containing a big lot of information about painting systems, including

Sign the coupon and receive the booklets without any cost to you.



Valentine's Celox Four-Day System THE QUICKEST IN THE WORLD.

VALENTINE & COMPANY, 257 Broadway, New York

Name
Address
Town
State
Cut off & mail to
Valentine &
Company

Please mention "The Hub" when you write.



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
New Haven, Connecticut

WILLEY'S COLORS

The **RECOGNIZED STANDARD**



C. A. WILLEY CO.
COLORS GRINDERS

and Manufacturers of Specialties in

**CARRIAGE, AUTOMOBILE AND CAR
PAINTS**

COLORS, VARNISHES, ETC.

HUNTER'S POINT, NEW YORK CITY

Headquarters for "The H. D. Smith & Co.'s" Carriage and Wagon Forgings

JACOB GERHAB

Dealer in

**Carriage Cloths, Leathers and Trim-
mings, Wagon and Cart Material**

Salable prices and all information cheerfully furnished.

158, 160, 162 and 164 North Third Street.
PHILADELPHIA, PA.

ESTABLISHED 1845

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

**AUTOMOBILE
WHEELS**

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply any style demountable or detachable rim or tire.

GEARS

Our gears are theoretically correct, and give the maximum amount of satisfaction.

Are you enjoying this **BEST** service?

If not, **INVESTIGATE! NOW!**

FROST GEAR & MACHINE CO.
JACKSON, MICH.

KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

It fills the pores of Metal and Wood perfectly. Sandpapers easily and produces a fine, smooth surface that **DOES NOT CRACK, SCALE NOR PEEL.**

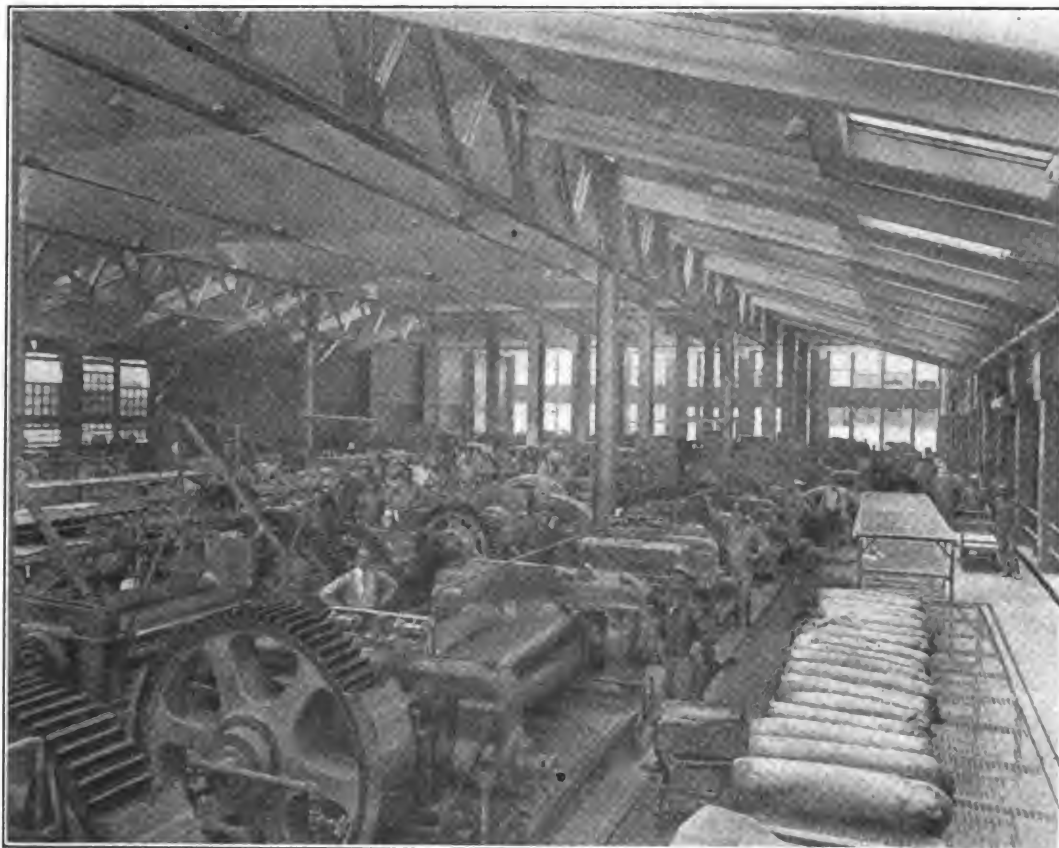
POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.



GOODRICH "SERVICE"

The Mill Room



Here the rubber is rolled or milled to give it proper consistency. This is the next step after the cleaning and drying of the crude. In other words, this picture shows the manufacture of rubber. Further on, the rubber is patterned into articles of sale, and cured.

This Department, representative of the equipment of the plant of the B. F. Goodrich Company, is the largest and most completely equipped Mill Room in the world.

The B. F. Goodrich Company

Akron, Ohio.

PROTEKTOL

The Modern Paint Reducer

If PROTEKTOL had been known before linseed oil, the linseed oil salesmen would have a hard time convincing users of PROTEKTOL that linseed oil is "just as good."

70 Cents per Gallon.

Write For Descriptive Booklet

Branches:

New York, Philadelphia
Buffalo, Toronto
Montreal, Buenos Aires

THE AULT & WIBORG Co.
VARNISH WORKS
CINCINNATI.

Branches:

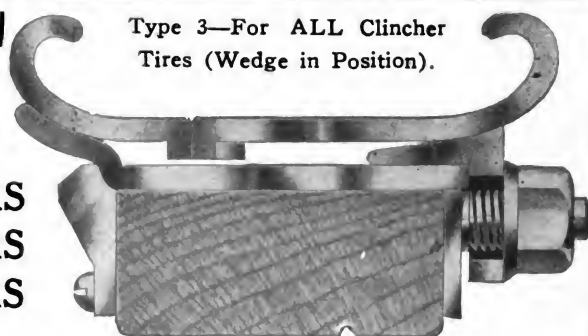
Chicago, St. Louis.
Minneapolis, San Francisco
Mexico City, London, Eng.



Type 2—For ALL Straight
Side and Clincher Tires.
(Clamp Unlocked.)

**STANDARDIZATION
OF RIMS THAT
BENEFITS**

**CAR BUILDERS
TIRE MAKERS
CAR OWNERS**



Type 3—For ALL Clincher
Tires (Wedge in Position).

The Standard Universal Quick-Detachable Demountable Rims

"FIT ALL TIRES" and SOLVE THE PROBLEM OF INTERCHANGEABILITY

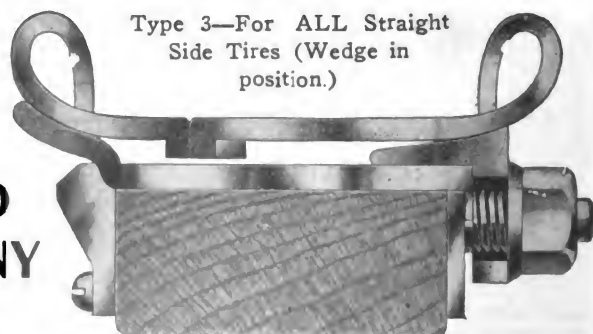
25,000 Sets of Demountable Rims and 135,000 Sets of Quick Detachable Rims; practically 96% of the total number of Rims made in the United States, have been contracted for by 100 leading manufacturers.



Type 1—For ALL Straight
Side and Clincher Tires.
(Clamp locked.)

Write for illustrated
descriptive matter.

**THE UNITED
RIM COMPANY**
AKRON, OHIO



Type 3—For ALL Straight
Side Tires (Wedge in
position.)

Please mention "The Hub" when you write.

The

Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

JULY, 1911.

No. 4.

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President.

G. A. TANNER, Secretary and Treasurer.

24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00

AMERICAN HARNESS AND SADDLERY

DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Mieser, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

The Torpedo Body.

When the novelty microbe gets its fangs into the imagination of the designer there is no way to frustrate an ultimate result; just wait and observe.

The abuse of all good designing is the exaggeration that follows. The first idea of the torpedo design was protection to the passenger from wind and mud when going at speed.

The dry goods box affairs was finally deeply upholstered as to seat, quite couch-like in its comfort, putting to rout all the shocks of the road, and just the thing for the spineless, luxurious traveler.

Then came the "refinements."

Extremes of fashion insisted on more height to the straight line sides, the dash was made more and more like an unprofessional coal scuttle, and the final closing in by fixed wind-shields made the passengers as snug as if in a ship's cabin.

The advantages were winter advantages applied to a car ostensibly for fair weather touring.

As the season advances, and we taste the hot delights of July and the steaming qualities of August weather, all the

beauties of the evolution of the torpedo design will be made manifest. The passenger will gasp for the air he is touring with a view to breathing in. The heat will be a fair exchange for a steam bath, and the upshot of a season's experience will be a willingness to trade the latest fashion for almost any design that affords some ventilation.

The pronounced human trait to rush to extremes is the cause of it all. Experience will correct the tendency, but it is peculiar that the designers should not have had some notion of where the fad was leading, and become a little conservative in the patterns.

Slump in Flying Apparatus.

A man in Paris well advanced in all that has to do with aeroplane affairs says the interest and the business are below normal.

The flying meets are monopolized by a few professional cracks, and although promoted with a selling idea as an afterthought, it is plain that the price of the "birds" is too high, even with a cold bottle thrown in for good measure.

Five to six thousand dollars is a heap of money to disburse for one of those extra-hazardous machines, that go to pieces at the very first jolt against Mother Earth, and the men and women who can afford the high-strung luxury are in a class that has a profound respect for its neck, with no desire to bid farewell to life via the sudden death route.

We think the price of aeroplanes will have to come down to a level that will allow of the accident insurance companies doing a good business, and let thrills be our daily food, before the industry gets on a paying basis.

Praise-With Chili Con Came.

Henry Sturme, a very well-informed Englishman, has looked us Americans over professionally, and in saying some nice things, he adds a little seasoning that ought to agree with us if consumed in a proper spirit. We quote him with pleasure:

There is one thing I like about the American way of doing things; they strike out on their own original lines, and they do call things by names of their own, which are generally apt and appropriate, instead of doing as we do over here so much—copy the French and talk of "chauffeurs," "garages," and so on. It does not, of course, always follow that originality in design is necessarily an improvement upon the methods followed in other countries, but, when one looks at American original design, not only in motors, but in almost anything in the shape of mechanical construction, one cannot help being struck with the fact that, although the fulfillment may, to our ideas, fall short in many

important particulars the ideals aimed at are sound in theory. Yet in all too much of American work, the universal and consuming mania for cheapness of production steps in and spoils things, and this applies as much to motorcars as it does to bicycles and other constructions. In this the manufacturers are not, altogether to be blamed, because the goods thus produced are, to a large extent, what the American public demands, or at any rate what it is prepared to accept, in contrast to the demand of the public in this country, which, while not desiring to pay a higher price than is necessary, must first be satisfied on the score of quality in motor vehicles as to durability and reliability.

So long as the price is right, your average American is prepared to take much on trust, and is more generally ready to "take chances" than is the slower and more cautious European; hence, while a comparatively few manufacturers in the States lay themselves out for the high class trade, when most American manufacturers and capitalists go into a new industry their aim is to get at the "man in the street," and to produce in large quantity. In the bicycle trade, the result of this was simply to kill the bicycle, for they stripped everything off it which made it enjoyably rideable, in order to secure lightness, simplicity and cheapness. They practically killed it, although they were mighty proud of their achievements at the time. So with the motor car. Although a year or two behind us in Europe in taking up the automobile as an article of manufacture, they at once, when they did go into it, designed and produced in quantity at prices which no European builders could produce cars at, until the many shortcomings of their immature constructions knocked the bottom from under their own success. History is again repeating itself, to-day, not only in connection with the pleasure car, but also with the commercial vehicle, which your good American speaks of as a "truck," a term which, while rather uncouth, is short and expressive and less cumbersome than "commercial motor vehicle." Having overdone production for the moment in the pleasure car line, manufacturers are turning their attention to the commercial vehicle as a means for the employment of their plants and are, for the most part, going into with all the haste and slap-dash hurry which has been characteristic of their pleasure car efforts. As with us, until now, but few manufacturers have given any attention to the "truck," although some few have, for a year or two, specialized upon this side of the industry and have, I believe, produced fairly practical vehicles. Now, however, all seem rushing in, and the same broad air at practicability is displayed, while the same wild effort at ultra-simplicity and extreme cheapness, to which I have above referred is making itself apparent.

Another Way to Prevent Slipping Tires.

A man has had the idea to mix steel filings into the tread of the tire to prevent tire slip. He says it is very satisfactory.

The small particles of the hair-like steel protrude from the tread just like the new hair from a man's closely shaven pate, gripping the greasiest road surfaces. So runs the record.

The best grip on the advertising situation is held by the man who puts his name all over the tread, but the really finest, unpatented anti-skid is to go slow on side hills, and when turning corners.

Turbines.

There is much scientific talk broadcasted at present as to the adaptability of gas turbines to motor cars.

It's a very interesting idea. Rotary power has great advantages over reciprocating power. A practical appli-

cation of the turbine, if it comes about, would do away with a great number of engine parts that now plague the car owner. It would be a revolutionary change.

As yet opinion is divided into the can-do-it and it-can't-be-done classes. It is common, everyday opinion versus professional, highly specialized thought right now, the kind of expert engineering talent that appeared before Parliament in Stephenson's time and proved by theorem that the crazy inventor's locomotive could not positively run on a cogless rail. Perhaps the turbine cannot be developed. If it is it will be by some rule-of-thumb fellow who knows more about tree toads than triangles, but just the same will have the practical, workable idea. We would like to see such an evolution in the motor engine.

"Fool-Proof."

Fool-proof seems to be a phrase in high favor among automobile engineers. It must be so because we see it used as plentifully as meaningless diagrams and charts in the journal that poses as the representative of all motor engineering lore.

It must be true, we suppose, that lack of really practical knowledge of engines and the practice of engineering, is wider even among car owners than it is in the ranks of the S. A. E., but this does not make of the intelligent car driver a fool, nor would a knowledge of the fanciful flapdoodle printed as scientific knowledge, make him fool-proof engine-wise.

Fact is the engineering knowledge is a very insecure foundation to stand upon. The engineer has groped, made ridiculous experiments, copied one another's mistakes and has merely stumbled forward progressively. Give the fool a respite.

CARRIAGE BUILDERS' WEEK AT THE SEASHORE.

The Carriage Builders' National Association will hold its annual convention and exhibition at Atlantic City, N. J., from Monday, September 25 to Friday, September 29. The larger number of members, exhibitors and visitors, we believe, will arrange to stay in the pleasure city the entire week, and thus take advantage of the "weekly rate" granted by nearly all of the hotels.

A solid week at Atlantic City will give the carriage and wagon men and their families plenty of time to see and enjoy the many-sided attractions of the resort.

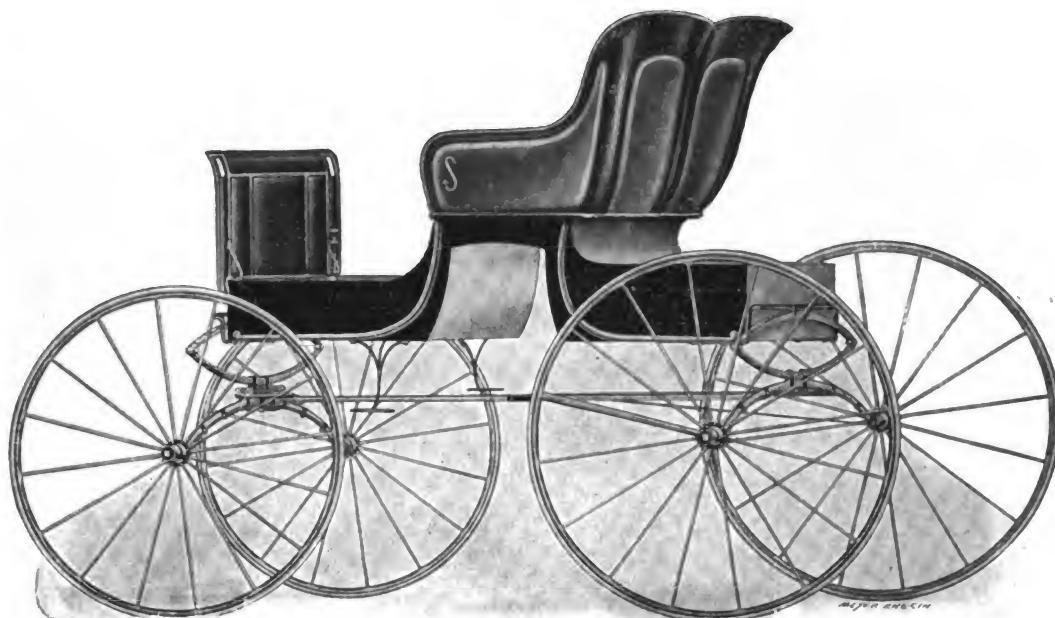
No better plan for a vehicle man's vacation could be suggested than that he combine business and pleasure for one solid week at the Atlantic City convention of the C. B. N. A. No season of the year is more pleasant on the Jersey coast than are the early weeks of the autumn, no better time could be selected for that recuperation which every business man needs after the long, enervating summer, to prepare him for the activities of his next busy season. A week at Atlantic City will supply a tonic both to his health and his business.

We owe it to our wives and families that they should also participate in this delightful outing at the greatest of American seashore resorts.

HENRY C. McLEAR, Secretary.

Glue that is forced out of a mortise joint and allowed to dry and become hard can be easily removed with a sharp chisel dipped in oil.

Vehicle Fashions for July, 1911



REGAL BUGGY CO.
St. Louis, Mo.



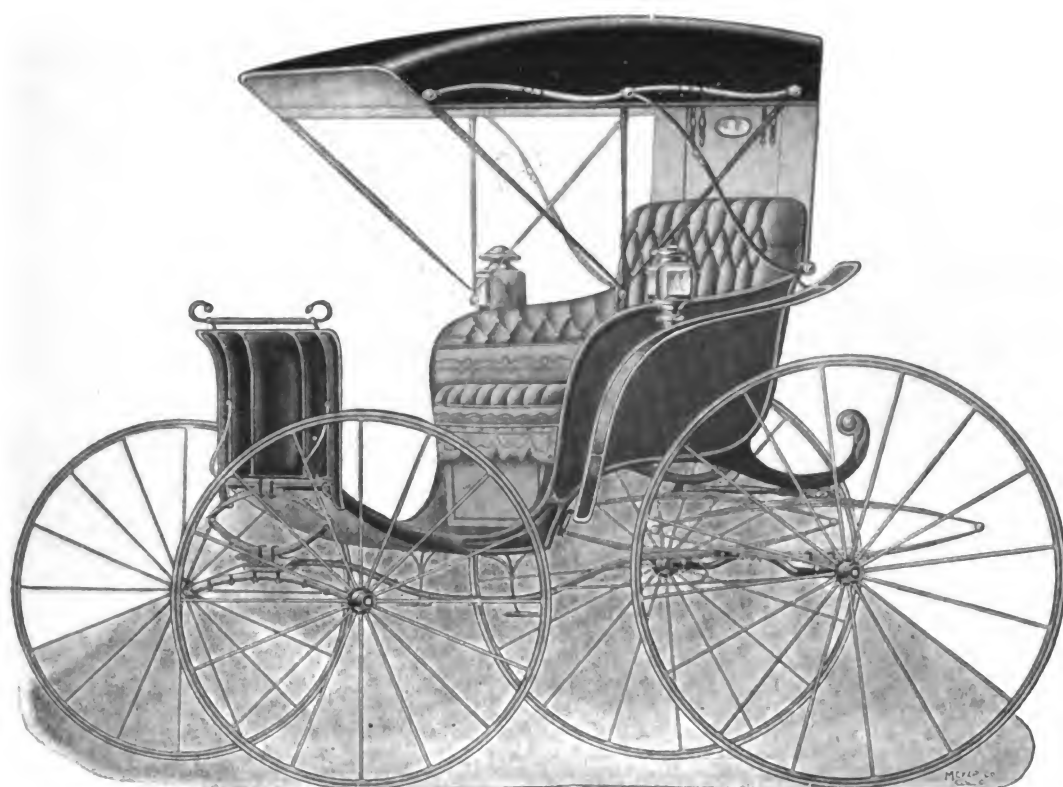
ELKHART CARRIAGE CO.
Elkhart, Ind.



PEERLESS MOTOR CAR CO.
Cleveland, Ohio.



PARRY BUGGY CO.
Indianapolis, Ind.



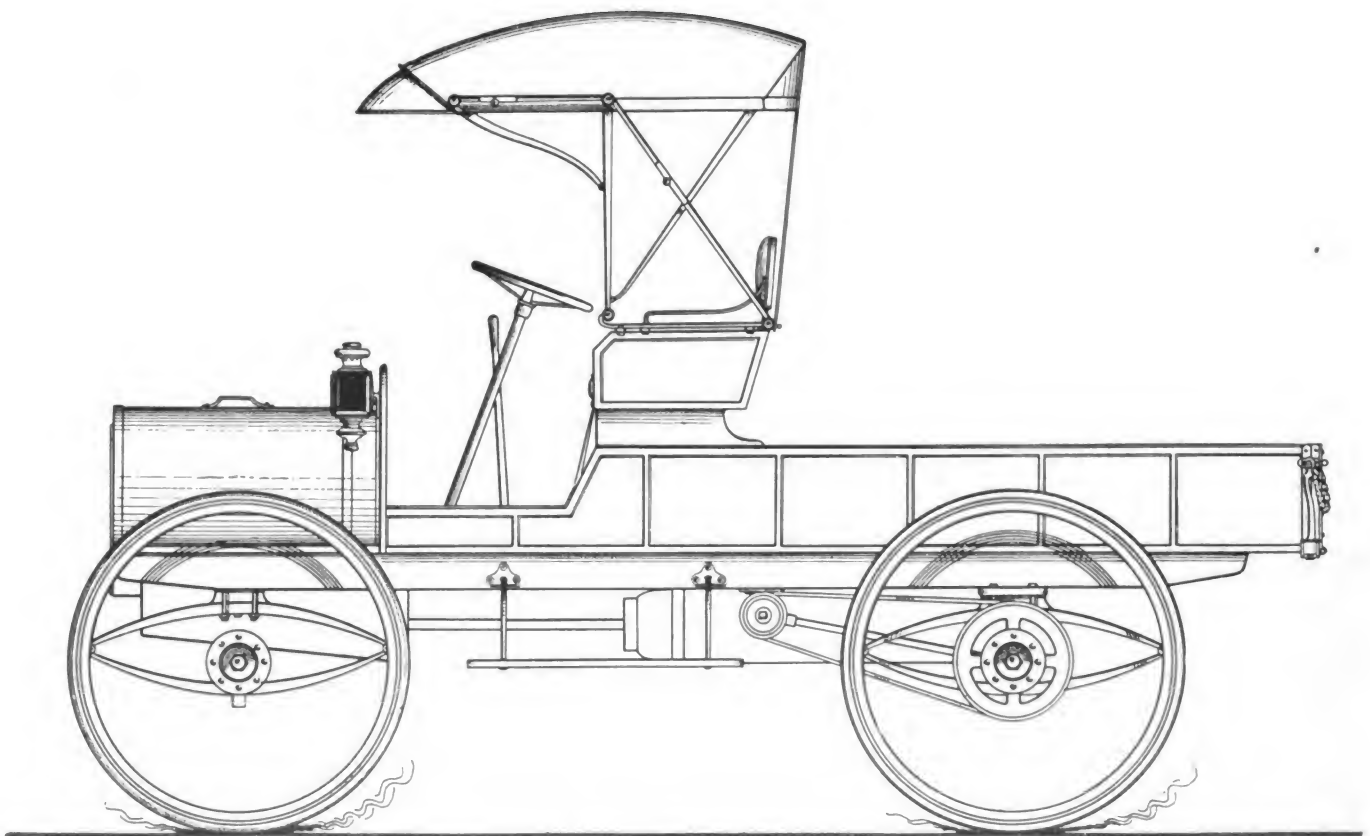
RATTERMANN & LUTH.
Cincinnati, Ohio.



STAVER CARRIAGE CO.
Chicago, Ill.



PEERLESS MOTOR CAR CO.
Cleveland, Ohio.



CHASE MOTOR TRUCK CO.
Syracuse, N. Y.

Wood-working and Smithing

DRAWINGS FOR THE MONTH.

(Illustrated on foregoing pages.)

The so-called auto-seat for buggies seems to be a popular style, as it is applied to certain styles of buggies by about all the conspicuous makers of horse-drawn vehicles.

Although the type does not admit of much variation in design, yet ingenuity has made modifications, and it has been our wish to illustrate some of them this month. They should prove interesting as a study.

The first example is that of the Regal Buggy Co. The lines are pleasing, and the seat looks as if it might be as comfortable as a rocker for the passenger not engaged in the driving.

The Elkhart Carriage Co. has yet another idea as to depth and rise of seat, and the effect achieved is certainly a pleasing one.

The Parry Buggy Co. seat varies a little from the other two, and yet another good effect is secured. The Parry example is further interesting from the fact of the steel body that this company is now featuring with success. The merits of an all-metal body are many beside the prime one of great durability. The manipulative methods make it as easy to fashion as wood, and it is fair to presume that the metal age has made its appearance to stay. More reasons than the scarcity and high price of suitable lumber can be advanced.

The late Grant Burroughs once said that the only way to account for the destruction of Cincinnati buggies—meaning a type—was by a bolt of lightning. This witticism has lost its force with the advent of steel construction. Nothing but an exorbitant demand for junk metal will in future destroy the work of the buggy builder.

The phaeton of Rattermann & Luth is a very pleasing example of a mighty good looking vehicle for just a little money—this illustration being a good explanation as to why the business of this factory is so flourishing. It doesn't cost much if any more money to put good looks into a job, if the ease of selling it is counted.

The Staver Carriage Co. auto-seat job curiously directs attention to the almost exact similarity of a style. Compare it with some of the others. It comes down to a question of material and finish when competition in style is so equal. Those familiar with Staver work will be well content in this regard.

The two examples of Peerless trucks are selected from jobs that are seeing service and meeting heavy demands with success.

In both instances the power plant design is the same. This company is very thorough in its undertakings, so it is natural to look for the good results attained.

An interesting high wheel light delivery motor is that of the Chase concern. For all-round efficiency examples of this kind are giving very good results, and meeting with deserved popularity.

SUGGESTION FOR DOUBLETREE KINGBOLT.

The usual method of connecting the doubletree of the heavy two or three-horse truck to the futchels spells neither of safety nor durability nor guarding against accident. There is an even-bar plate on the under sides of the futchel ends, in the center of which is a large hole countersunk for the head of the kingbolt.

In order to insert this bolt, it becomes necessary to remove the top plate, made chiefly to hold the pole pin.

At best, the doubletree kingbolt seldom lasts longer than five or six months. It is always a rattlebox, and causes trouble whenever an effort is made to remove the nut.

Fig. 1 gives an idea of its construction. A, A top of futchel; B,

B, front ends of the same; C, space between the jaws for insertion of pole. D is the bottomplate, with kingbolt hole X. The dotted lines E, E, represent the upper plate secured to the futchels by means of the bolts F, F, which also secure the bottom plate. The hole X is for the insertion of the pole pin. This plate is wider than bottom plate to allow of hole Y.

Fig. 2 illustrates the new or improved method.

A, A the upper surface of futchells; B, B, front outer ends of the same. C is space between futchells for back end of pole. D

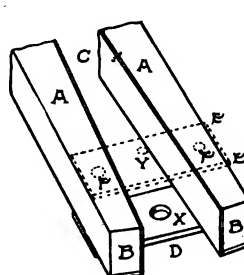


FIG. 1.

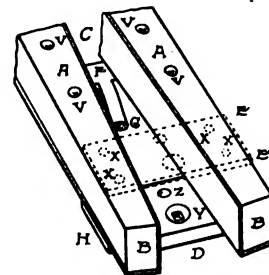


FIG. 2.

shows that part of bottom plate between the futchel jaws, of which H shows an outer end. Y is the kingbolt hole; Z the polepin hole. The dotted lines E, E, represent the upper plate, which is supplied with holes like bottom plate, D, for kingbolt passage, also for polepin. Both plates are secured to the futchels by means of bolts X, X, X, X. F shows center of kingbolt stay, which is secured to the under side of the futchels by means of bolts V, V, V, V. G is part of the projection in front which forms the stay portion.

Fig. 3 is outline of stay. A' A, the plates which fit under and secure to the futchels as per bolts V, V, V, V, Fig. 2. B is as per Fig. 2. C is as per G, Fig. 2, but carried out to proper length and with eye, D.

Fig. 4 is the bottom plate, of which A is the surface, B is the kingbolt; C, polepin holes are for securing bolts not less than 7-16 inch. This plate ought not to be less than one inch thick and

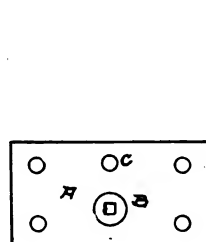


FIG. 4.

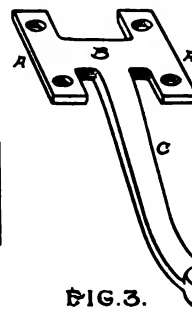


FIG. 3.

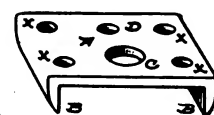


FIG. 5.

six inches wide. The hole, B, must be counterbored on the upper side to admit of the head of the kingbolt setting even with the surface, that it may clear the pole.

Then there must be formed below the head a square hole which is to prevent the bolt from turning when securing or loosening the nut. The bolt ought not to be less than 3/4-inch in diameter. The head in diameter ought to be at least 1 1/4 inches, which gives it 1/4-inch bearing on all sides.

Make the head not less than one-half inch thick, which permits of the square part being made one-half inch long. By means of this method of construction the bolt does not wear on the plate; if it does, it is but slight.

The plate is made six inches wide, which permits of ample

wearing space for the doubletree and allows of its clearing the polepin.

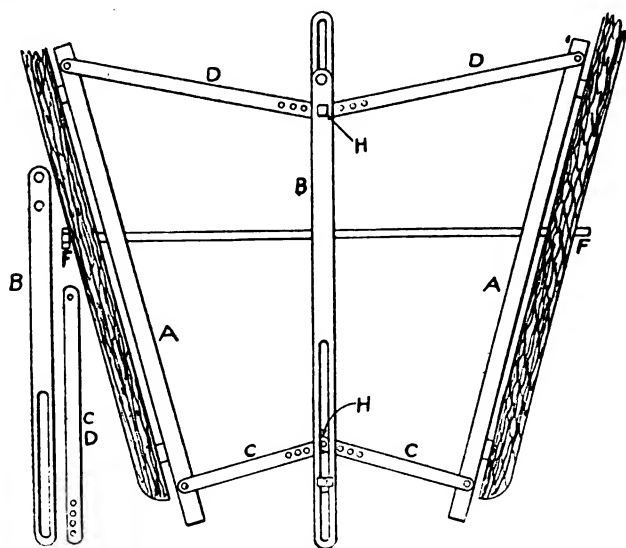
Fig. 5 is the top plate, made of the same dimensions as the bottomplate (Fig. 4), less the thickness, which make $\frac{3}{8}$ -inch. A is the surface; B, B are the lugs turned down on each end to enclose the futchels to prevent spreading and to relieve strain from pole. Make B, B $1\frac{1}{2}$ inches long, each. C is the hole for passage of head of kingbolt when necessary to remove the same. D is hole for polepin; X, holes for securing bolts.

Make the bottom plate of the doubletree with a boss, which is to be counterbored into eye, D. Fig. 3, which prevents wear on bolt, also on plate.

The foregoing does not interfere with placing of futchel stays.

ADJUSTABLE AND SELF-CENTERING GAUGE FOR FITTING WAGON HOUNDS.

Did it ever puzzle you to fit a pair of hounds to a wagon tongue so as to have a snug fit and both sides exactly alike? asks Carl Youngstrom, in *American Blacksmith*. It puzzled me until I made the gauge here illustrated. It is adjustable, and at the same time self-centering. To make it, take a piece of $1\frac{1}{2}$ or $1\frac{3}{4}$ -inch angle steel, 32 inches long and cut it in the center. You then have two pieces 16 inches long. In the center of each, drill a $\frac{3}{4}$ -inch hole to admit the draw-bolt F. From this center mark off seven inches towards each end and drill $\frac{1}{4}$ -inch holes at right angles to the big holes. At six inches from the center bore $\frac{1}{4}$ -inch hole in the same flange as the big hole. Now cut four pieces of iron of the thickness that is generally used for hound irons ($\frac{1}{8}$ inch) and rivet them to the angle iron, one at each end at the last holes bored. Have countersunk holes in the small pieces so they can be brought up to the inside of the wagon hounds. The two 16-inch pieces are now ready. Now cut two pieces of band steel $1\frac{1}{2}$ by $\frac{3}{8}$ by 17 inches long and bore a 3-16-inch hole close to one end. One and one-half inches from the same end bore a hole big enough for a $\frac{1}{4}$ -inch bolt. At the other end make a slit about

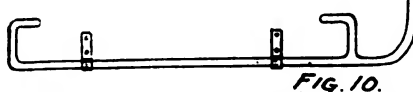
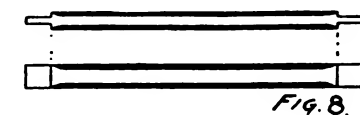
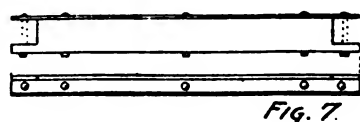


AN ADJUSTABLE GAUGE FOR FITTING WAGON HOUNDS

four inches long and wide enough to allow a $\frac{1}{4}$ -inch bolt to move freely in it. (See B B in the engraving.) Of the same size iron cut off two pieces eight inches long and two pieces 12 inches long and bore a $\frac{1}{4}$ -inch hole in one end of each of them and in the other ends bore a series of $\frac{1}{4}$ -inch holes about one-half inch apart. Be very careful that the two pieces which constitute a pair are exactly alike or the centering arrangement will not be perfect. All the pieces are now ready to be assembled. Take the angle irons A A and rivet the pieces C C and D D to them as in the engraving. Take the two pieces B B and place them with the slitted ends in opposite directions, place the pieces D D between them and put in the bolt at H. The pieces C C are placed in the

same manner. It is very important when placing pieces D D and C C that the bolts go through corresponding holes in the pairs or the gauge will not be true. The length of the straps depends on the width between the hounds, but the length here given was proved sufficient for every wagon that comes my way.

Now, to use it, adjust the straps by putting the bolts H H through the holes which will admit the gauge to slip in easily between the wagon hounds. In drawing the bolts, press the bars B B up against each other until A A fit up against the wagon



MORE DETAILS OF CONSTRUCTION

hounds. Now lock the bolts H H, pull out the draw bolt F and push the gauge back so it is released. Now place the gauge on top of the wagon tongue and fasten it in the center of same with two woodscrews. Then turn the tongue over and fit the hounds. Mark the holes in the hounds before you take the gauge off, after which you need it no more for that job.

This easily-made device greatly simplifies the work of fitting wagon hounds and insures accurately-fitted hounds for each job.

WHY LUMBER STAINS.

Staining of lumber is always caused by stagnation of the sap or water in the cells of the wood. So long as the tree is standing and, as we say, alive, the movement is, of course, continual. When the tree is cut, the action ceases. If the stock is piled so that evaporation is continually taking place on its surface, the movement of the sap continues and no staining can take place any more than can the animal life in it stain a moving stream of water. It seems to be absolutely the motion of the water in the cells that prevents staining.

The reason stock dries outdoors, and faster than under the shed, is on account of the freer circulation of the air, aided more or less by the sun. After the stock has been partially dried, water will not condense and gather on the outside as on green stock and it has the same effect in depositing water on the wood, if it is allowed to remain there, relative to staining, as in the original sap. Staining from the ground is caused by the moisture rising and its impact on the wood, which prevents drying. To understand this, we should have in mind that moisture in the air, as it is condensed by lowering of temperature, is held like a miniature soap bubble; the impact of these, as the fog on a window pane, brings the visible moisture to water. This effect is noticed particularly in steaming. Throw steam, as it becomes a visible vapor in air, against a board, and the water forms by impact, running from the board in a continual stream.

The water from the condensation of steam will stain stock just as water formed by condensation from the air, as it would absorb and take up starch from the wood. Another effect obtained by piling stock in the shed or under cover is, in climates where there is considerable humidity, the stock, cooling down at night, will absorb moisture in the middle of the day from the heated, humid air continually blowing against it. This causes a

great amount of checking, the end of the wood drying so fast that the tension becoming great, the stock splits in the center, the continual change of temperature and moisture from night and day and changing of the seasons, frequently, in a heavy plank running 2 or 3 feet from the end.

If stock is to be piled under sheds, it is better to pile in one single tier raised two feet above the ground. It might be possible, if we wished to pile stock under the shed, to pile it in this manner with little or no staining, at certain seasons of the year. At other times, when the air has no drying capacity, such as early in the spring, late in the fall or midsummer, it is not so certain but that it would need the small amount of sun it gets to prevent staining.

GERMAN NOVELTIES.

Our attention has been drawn to two folding roofs for covered cars which have been recently brought out by Allgemeine Elektrizitäts Gesellschaft, of Berlin. The first of these, which is shown in Fig. 1, is described as a folding cover characterized by the coach joints having the shape of a "V" at the upper end, and being connected by means of connecting rods to angle irons secured to the roof. To the roof a are secured at the side angle irons b, with the ends of which engage connecting rods, which transmit

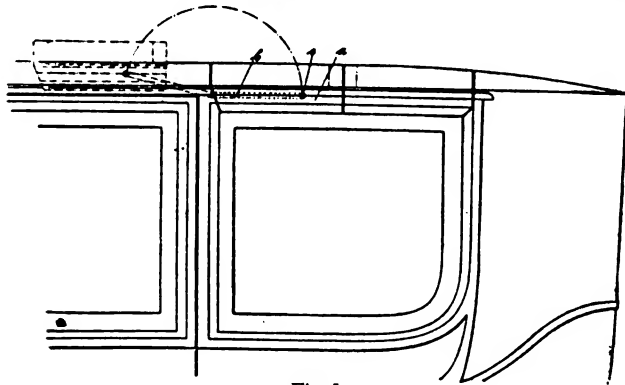


Fig. I.

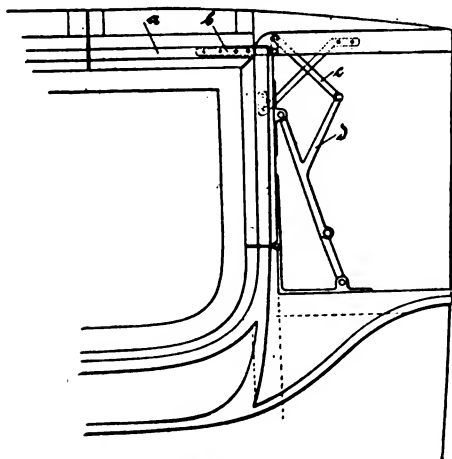


Fig. II.

the pressure of the bell crank levers b to the free end of the upper V-shaped portion of the coach joint d. Owing to this arrangement, on the roof a being folded up, the coach joint is automatically bent in at the hinge joint and the cover folded back without any further manipulation.

On the cover being closed, the coach joint is secured in its position without it being necessary to secure the hinge joint separately by means of a screw and spanner.

Fig. II. represents a folding cover characterized by lateral guides being provided for the front position of the divided roof, which guides enable the said cover or flap to come to rest on the fixed car roof, always with the inner face downward.

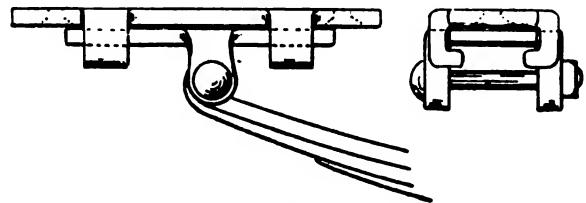
The cover portion or flap a is provided with lateral guides b

secured at c to a through spindle. By the duplicate use of the parts b, the flap would be guided parallel in an entirely positive manner.

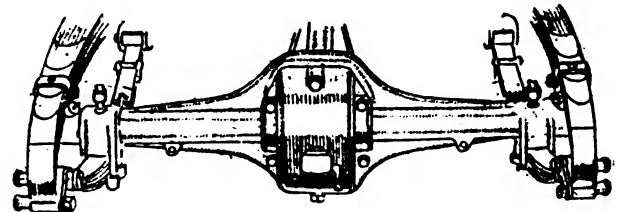
Owing to the arrangement in question, the front portion a fits so tight with its inner curve the outer curve of the fixed roof, that the height above the latter becomes considerably smaller than in the folding devices generally used. At the same time, the inner side of a is always sheltered or protected.—Cooper's Journal.

SOME HAPPY IDEAS.

Here is illustrated a plan for hanging rear spring of a wagon. It shows a distribution of wear over a larger surface, giving more service.



Arrangement of back axle, showing underslung springs and oscillating spring pads, instead of in the more ordinary position



above it, while the spring pads themselves are free to oscillate on the axle casing. All the shackle bolts, etc., are provided with greasers.

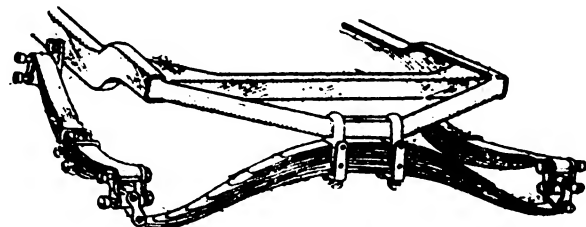
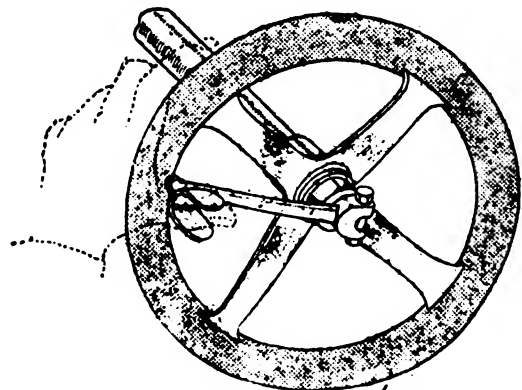


Illustration showing detail of hanging transverse spring for rear suspension.



Here is the application of a universal joint thumb rest on the throttle control lever.

MAKUTCHAN ROLLER BEARING CO.

The Makutchan Roller Bearing Co., 160 North Fifth Ave., Chicago, Ill., succeeds the Ball Bearing Wheel Co., of that city.

INTERESTING TO EMPLOYERS OF LABOR.

The following statistics have been compiled from a London Times summary, transmitted by Consul General John L. Griffiths, of the Fourth Abstract of Foreign Labor Statistics, published by the British Government, covering the hours of labor trade-unions, and trade disputes in the several countries:

Austria—The legal maximum is 11 hours a day, but is exceeded, under permit, by a large number of workpeople, particularly in the textile trades. In the mines the predominant hours are 8 to 9 and in factories 9 to 10 and 10 to 11.

Belgium—In the metal industries nearly half the men work from 9 to 10 hours and the great majority of the rest 10 to 11.

Denmark—The predominant daily hours in the various industries are 10 and 9 to 10.

Finland—Only 15 per cent of all the handicrafts work less than 60 hours per week, 56½ per cent over 72 hours, 18½ per cent over 84 hours, and some work up to 120 hours, or 17 hours a day for seven days. This, however, includes intervals for meals, and perhaps, for rest.

Germany—In Prussian coal mines the usual underground shift, not counting descent and ascent, is 8 hours. On Prussian state railways the predominant hours are 8 to 9 and 9 to 10 hours; more than half the locomotive men and plate layers have less than 9 hours, but 54 per cent of pointsmen and signalmen are on for 10 to 12 hours.

Italy—In factories and workshops more than three-fourths of the employees work 10 to 11 hours.

Netherlands—The predominant hours in most industries are 10 to 11 per day.

Switzerland—In factories the predominant hours are 9½ to 10 and on Saturdays 1 hour less.

United States—In the large cities the average week in certain selected occupations ranges from 44 hours in the building trades in New York, Chicago, St. Louis and San Francisco, to 60 hours for laborers in Philadelphia, Cleveland, Pittsburg and Detroit. For the whole country: Building, 46.3 to 54.5; engineering, 53.4 to 58.4; textiles, 55.6 to 60.4; clothing, 51.3 to 56.2; paper, 56 to 59; printing, 50.7 to 53; wood, 55 to 58.

The usual age of beginning work in the several countries is as follows: Hungary and Spain (factories), 10; Norway, Sweden, Denmark, Netherlands, Belgium, France, Italy (not in factories) Bulgaria, Luxemburg, Portugal, Roumania, and in 11 American States, 12; Germany, 13; Switzerland and Austria (factories) and in 36 American states, 14; South Dakota, 15. A distinction is made in several countries between ordinary occupations and mines; admission to the latter is at a later age.

The number of trade unionists per 1,000 occupied inhabitants in 1908 was: United Kingdom, 130; Germany, 86; France, 49; Austria, 36; United States (including unions outside the Federation of Labor), 85. For the year 1909 the total membership in Germany is brought up to 3,597,259 by the inclusion of "Roman Catholic and Protestant unions" not previously reckoned. The trades showing the largest membership vary greatly in different countries. In Germany the leading groups are metal workers and building trades; in France, transport; in Belgium, mining; in Austria, metals and transport; in Norway and Denmark, laborers; in Holland, diamond workers; in Italy, agriculture; in Switzerland, transport; in the United States, mining and building.

As a general rule, disputes are most frequent in the building trades, but these are exceptions. In the United Kingdom mining, in Belgium textiles and mining, in Italy agriculture have the largest number. By far the most frequent cause of dispute is wages and next is hours. Results are classified under three headings: (1) In favor of workpeople; (2) in favor of employers; (3) compromised; the proportions vary greatly in different countries, and from year to year. In most countries the majority of disputes are returned as compromised, but Belgium, Germany, and the United States are exceptions. Belgium is remarkable for the

large number ending in favor of the employers; the average proportion for 10 years is 75.8 per cent; against 13.2 per cent in favor of workpeople, and 11 per cent compromised. No other country approaches these figures.

In Germany there were, in 1909, 483 industrial courts, which intervened on application in 154 disputes; of these 121 were settled by conciliation and 20 more by decisions after failure of conciliation. The greatest activity of the courts occurred in 1906, when 253 disputes were referred to them and 224 settled. In France the law is much less successful. In 1908 it was put in operation in 182 cases, of which 49 were settled by conciliation committees and 12 without them. The greatest activity was in 1906, when there were 302 cases, of which 113 were settled. In America the States of New York, Ohio, Missouri, Illinois and Massachusetts have conciliation laws, but the effects are meager except in Massachusetts, where the State board has effected an annual average of 103 settlements during the last five years. In New York the State board shows a considerable increase in activity during recent years. In 1909 it intervened in 81 cases and settled 24. Conciliation laws exist, but seem to be little used in Belgium, the Netherlands and Italy. In Sweden there were 69 interventions, of which 62 were successful in 1908, and 88 interventions with 79 successes in 1907. This gives the highest percentage of successful intervention of any country—90 per cent.

STATISTICAL RECORD OF THE DEVELOPMENT OF THE UNITED STATES.

Seven hundred and fifty pages of solid figures unaccompanied by text discussions other than explanatory notes, form a rather uninteresting looking volume issued by the Bureau of Statistics of the Department of Commerce and Labor, entitled Statistical Abstract of the United States, yet this annual volume, the thirty-third issue of which has just made its appearance, is called for by thousands of people in every part of the United States and in fact in every part of the world. It tells of the area, natural resources, and population of the country from the adoption of the constitution to the present time; agriculture, forestry, and fisheries; manufacturing and mining industries; occupations, labor, and wages; internal communication and transportation, merchant marine and shipping; foreign commerce, internal commerce, commerce of non-contiguous territories; prices, consumption estimates, money, banking and insurance; wealth and public finance; the Civil Service, army, navy, pensions, congressional apportionment, the Presidential elections, the statistical records of progress of the United States from 1800 to 1910; and closes with a few pages devoted to commercial, financial and monetary statistics of the principal countries of the world. It is compiled by the Bureau of Statistics, in part from its own data of commerce and transportation, in part from data gathered by other governmental organizations.

This annual publication originating with the Bureau of Statistics thirty-three years ago, then a small volume of 110 octavo pages, has grown with the growth of the country and the demands of the public for additional information, to 750 pages in this thirty-third number just issued. Purely statistical, and thus appealing only to those desiring definite information in concrete form, it presents many interesting pictures of conditions past and present in the United States.

"SACRED TO THE MEMORY OF," ETC.

Our esteemed contemporary, The Hub, is in error in assuming that the American Vehicle is dead. It was purchased from the estate of the late Charles B. Sherron, not with the intent of continuing its publication as a separate issue, but to amalgamate it with the Carriage and Wagon Builder, which "marriage" was consummated with the January issue.—Carriage and Wagon Builder. The Hub should have said the American Vehicle was "buried alive."

Carriage and Automobile Painting

LOWER CASE OR SMALL LETTERS.

The small letters differ distinctly from the capitals commonly used by wagon painters. They are the lower-case letters used in printing, and any of the different styles of these employed by printers may be used by wagon painters, since there seems to be no distinct standard, every painter introducing some slight alterations of his own.

One peculiarity of the lower case letter is, that parts of some letters project considerably above or below the main body of the letter; thus, the a, c, e, etc., occupy the ordinary space, but the b, d, f, h, k and l extend above the body of the letter, while g, j, p, q and y extend as far below. These letters will be found to look best when the extensions above and below are equal to one-half the height of the letter, although they are very often made to vary greatly in this respect, according to the necessities of the space, it being sometimes necessary to compress or spread them to suit certain spaces. Such lower-case letters can never be

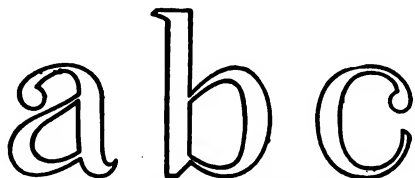


Fig. 1. New York Full Roman

used as "leading" letters, by which is meant the first letter of each prominent word, of course not including such connective words as "the," "in," "of," etc.

Fig. 1, accompanying, gives specimens of lower-case letters designed to be used in connection with the "New York Full Roman" capitals, while Fig. 2 shows similar small letters adapted to the "Boston Round Egyptian."

A careful study of these few specimens, and comparison with similar printed letters in any advertising sheet, will soon familiar-

ize the painter with these styles; and a little use of the dividers will indicate the proper proportions of the different parts.

The thickness of the lower-case is about two-ninths of the ordinary letters. A great advantage of the lower-case is that, by using it in proximity to large, heavy letters, the latter are made, by contrast, to appear much more bold and distinct.

There are two lower-case alphabets; the Roman and the Egyptian.

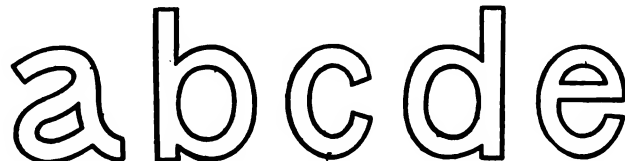


FIG. 2 BOSTON ROUND EGYPTIAN.

The Roman is the prettier of the two and more used. It is only necessary to remark that the Egyptian has no spurs or short hair lines, and can, therefore, be made a little larger in the same space than the Roman.

When these lower-case letters are used either between two lines of capitals, or in descriptive sentences or paragraphs, a leading letter is used. By "leading letter" is meant the first letter of each prominent word, except such as "the," "in," "of," etc. A careful study of the copy, and a little use of the dividers, will make the pupil familiar with these letters in a short time.

It is customary to letter business wagons of a certain class in a manner peculiar to themselves; for instance, the wagons of the different express companies. These are generally lettered on the body panel, between the ribs, and the style is usually an extended block, with the exception of the first letter of each word, which is higher than the other letters of the name, and this is the leading letter. The rule for these letters is that they shall be one-fourth higher than the others for small letters, and one-fifth higher for large ones. This rule does not apply to lower case letters, which, as above stated, have peculiarities of their own.



BLOCK LETTER.

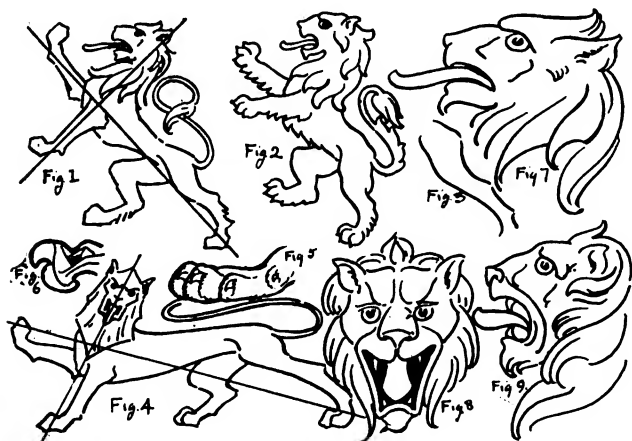
DO YOU KNOW HOW TO PAINT HERALDIC ANIMALS?

Mr. A. L. Duthie knows all about this subject, and in *The Decorator* he shows what a painter should do who is not a mere copyist.

It is well understood that a heraldic animal resembles any creature other than the one whose name it is called by, but, no live lion ever looked so much like a lion as a heraldic lion does. Perhaps we ought to say a good heraldic lion, because there are a number of heraldic lions knocking about which don't look like lions. Animals were adopted as heraldic devices on account of their supposed attributes and the lion, king of beasts, was supposed to be especially endowed with courage, fierceness, and endurance. We are all acquainted with a type of heraldic lion which suggests, not courage, etc., but merely straw stuffing.

The first thing is to get a good copy—that is not an easy matter. We may not all approve of the particular type of lion affected by Fra Anselm, but there is no gainsaying the fact that they look "alive." When you examine them closely you will find that the secret lies in "action." Those of you who are horsey men will know what "action" means—for the rest I must try to explain by means of drawings. I don't pretend to be able to draw heraldic lions—next to the human figure there is, perhaps, nothing I have more difficulty with—but I think I know a good one when I see it. A friend of mine remarked recently when we were discussing how much easier it is to criticise than to create: "I can't lay an egg, but I think I am entitled to my opinion as to whether the egg is good or bad."

A long time ago I came across in some German book (I cannot remember the name of it) a sketch somewhat on the lines of Fig. 1. Note how the action of the lion composed on those two



uncompromising cross lines compares with the romping kitten of Fig. 2. That is the first point—effective placing of the different parts to suggest strain and effort—movement. After that see that all your lines go with a swing. Draw the lion's hind leg, for instance, with a single swing like that in Fig. 3. Don't stop by the way to put in all the frills. Get the line first, and don't break it up too much afterwards. The clean limbed animal will always look more athletic.

Now for the English lions—passant gardant—"passant" does not mean passive—how shall we get some life into them? The cross lines do not apply so well here, but they help us, as will be seen in Fig. 4. Once more the long swinging line is most useful. Don't get the body too long, or the king of beasts will look more like a turnspit. Details of head and paws present difficulties, but these are not so easily seen at a little distance as the outline of the whole figure, and so need not worry us so much. Figs. 5 and 6 show the right forepaw of a lion, and the anatomical detail of one claw. We may note in passing that the joints of a lion's leg resemble those of a dog, not those of a horse, in which the proportions are quite different.

The lion's head can vary greatly in detail without losing much of its character but you must guard against flabbiness. The use of the straight line and the flattened curve is a great factor in vigorous drawing. Figs. 7, 8 and 9 give suggestions for slightly different treatments.

SHELLAC.

Lac is a resinous incrustation excreted by a scale insect. The mouth parts of this insect consist of a beak or sucking apparatus combined with a pointed lancet. With this lancet the insect pierces the bark of the twig of the tree and then inserts a sucking tube and draws up the sap.

The insect may be likened to an animated siphon, since the sap, continually sucked up through the beak, is, after modification and absorption of some of its products, given out as an excretion at the anal end of the body. This secretion solidifies on contact with the air, and thus there is gradually formed around the body a scale or cell, popularly known as "lac."

Were only a single insect present on a branch the scale would appear as a circular, dome-shaped, reddish excrescence on the surface of the bark. Owing, however to the production by the female of a very large number of eggs, often as many as 1,000 and the habit of the insects, which indeed, is common to many of the family, of living and feeding gregariously, closely packed together on one twig, the scales or cells coalesce during their formation and result in the production of a continuous incrustation on the twigs, which, on collection, forms the article of commerce known as "stick-lac."

From stick-lac we get the familiar "shellac," or shell-lac. Then there is also button-lac, plate-lac, and seed-lac, all in different forms, from which each variety gets its name.

Natives of India, where the lac is found, strip the trees of the heavily coated twigs and limbs and place them in hot water, which soon dissolves the resinous matter, freeing insects and bits of wood, and also washing out the coloring matter deposited by the insects. The separated lac is then taken out and dried, and later on is placed in strong bags of coarse cotton. These bags are then held near to a fire, which, while melting the resin, does not scorch the muslin. The bags are then squeezed and twisted. This treatment forces out the resin in thin films, these being received upon strips of wood. The resin quickly hardens on the strips of wood, and it is then removed by striking on the wood, the lac easily breaking off in the form of thin pieces, something like thin gelatin or glue, the form being well known to users of shellac.

The best grade of shellac is that which is most free from all impurities. As these impurities are dark, it follows that the best shellac is of the lightest color. It is a light orange or brownish cast. When they are squeezing the bag, some of the lac falls on the earth, in which case it takes on a button form, or drop, and hence is called button-lac. If these drops are large and spread out they become plate-lac. Stick-lac is the resin still on the twigs, but which have been broken for convenience in carrying. Under the lac trees are to be found quantities of lac that have been forced from the tree by winds or other means, and all this is carefully gathered up by the natives and sold as seed-lac. Briefly, shell-lac is superior because the best prepared.

Pure shell-lac is simply a combination of several peculiar resins, combined and mixed together as only the little lac insect can do it. This lac is important because of its adaptability for making varnish. Lac is easy of dissolution. In alcohol, also in a solution of borax, it gives a fine, hard finish, capable of taking a depth and brilliancy of polish not attained by any other resin or manufactured varnish.

The best grade of orange shellac can be bought from any reputable dealer, but the white shellac is almost sure to be sophisticated. This because it is so easy to adulterate, it having to go through the bleaching process to make it white. Being more ex-

pensive to manufacture, a little adulterating helps lighten the cost. It is also likely to contain some water.

Where orange shellac is adulterated the precipitation and drying differ from the action of the pure gum. If rosin is present—a very usual adulterant—the alcohol will hold the rosin in solution and precipitate the shellac down, the shellac being the hardest to dissolve, there being very few substances that will dissolve it.

Rosin causes shellac to dry soft. In the case of pure shellac the finisher may apply three coats in a day and rub down each and produce perfect work. But a coat of rosin-shellac will remain tacky for hours, so that one cannot rub more than the one coat a day.

A good pure shellac varnish should be fit to handle in 6 minutes, and to sandpaper in 30 minutes, without any gumming of the sandpaper. The second coat should dry in 7 minutes, it being applied within 30 minutes after the first coat. In two hours after the second coat apply the third coat, which should be hard to the touch in 10 minutes. In one hour after applying the third coat it should be fit to rub down perfectly in oil and pumice-stone powder.

When overtreated with chlorine bleached shellac is apt to become insoluble in alcohol. Formerly no treatment for its restoration was known, but it has now been discovered that if such insoluble shellac is first moistened with one-twentieth of its weight in ether, and allowed to swell in a closed vessel, its solubility in alcohol will be restored.

Orange shellac, as well as bleached shellac, must dissolve in pure alcohol, either grain or wood alcohol, without residue. The stronger the alcohol the more shellac will it dissolve. The amount of water in the alcohol determines its dissolving power, for the more water it contains the weaker it is.

A great deal depends on the method employed in making the shellac, temperature, etc. In the case of orange shellac, given the same degree of strength of the solvent, there will always be a uniform result in the varnish making. But it is somewhat different with bleached shellac, for with it much depends upon the process that was employed in the bleaching process. Some processes are capable of giving a very white shellac at an ordinary temperature—A. Ashmum Kelly, in *Woodcraft*.

TURPENTINE THEN AND NOW.

The time was when turpentine was about the cheapest thing a housekeeper could buy. The biggest bottle in the house was sent for 5 cents' worth of turpentine. Now a sewing machine oil bottle is big enough for that much.

Indeed, turpentine has so grown in value that unless when you call at the paint dealer's and do not specify that you want the genuine article he will hand you a substitute made largely of crude gasoline.

Some years ago turpentine retailed for 20 cents a gallon and now sells for 10 cents a half pint.

Turpentine is a southern product, and, while the demand has greatly increased, the output has largely fallen off.

The value of the output in 1910, though much smaller than the previous year, was 40 per cent greater than in 1909, all of which shows that the South has a very valuable industry, and one that demands scientific and careful handling of the pine forests that produce the resin of the turpentine to prevent the destruction of the trees. The old forests are already giving out and new areas are being worked.

The product is taken from the tree by chopping holes in the bark and sap, through which it oozes.

The trees have been overworked, and many large areas that were valuable have been killed by the greed of the turpentine companies.

The trees are natural growth and cannot be restored by re-planting. Their value will steadily increase, and it would be the sheerest folly to keep up the old methods of destruction.

"BOILED" OIL NOT BOILED.

Before describing the process of making a so-called "boiled" linseed oil, we believe the general impression which prevails regarding the word "boiled" in connection with linseed oil should be corrected. The term has no real significance in practice. The oil is rarely, if ever, heated above 240 degrees F., and as its boiling point lies well above 600 degrees F., one can readily see that no "boiling," i.e., bubbling, foaming and steaming, as is the case with water, really takes place.

This use of the word "boiled" probably originated with the almost forgotten process of heating the whole of the oil with metallic compounds in small vessels over a free fire, the proper temperature having been arrived at when a feather placed in contact with the surface of the oil would become scorched. Such a process in the light of modern achievements is unnecessary, impractical, and from the economic standpoint impossible, to say nothing of the poor quality of the finished product, which becomes heavy, dark colored and loaded with driers. Owing to the varying solubility of the chemicals used, the different atmospheric and climatic conditions obtaining at each time of boiling, and the small quantities (100 gal. or less) treated in each batch, lack of uniformity was inevitable.

That crude method by logical sequence led to the later and better process, but which we have abandoned, because, as we will show, it is still haphazard and unscientific: A concentrated drier is first produced by heating a small quantity of linseed oil with the oxides of lead and manganese at a temperature of about 400 degrees F., the idea being to introduce a certain quantity of the metals in concentrated form. Owing to the high temperature necessary, this must again be done over a free fire. The purpose of the process is to combine certain quantities of the metallic oxides with the oil, but on account of the great heat employed, this is done at the inevitable expense of the finished product. The action which takes place during the process is this: During the boiling a decomposition or breaking down of the chemical constituents of the oil takes place and strong smelling, acrid vapors are given off. This decomposition is largely responsible for the discoloration of the drier, and as this high heat has to be maintained for hours, in addition to becoming thus charred and darkened, the drier acquires unnatural body and viscosity.

It must be thoroughly understood that while this high temperature is not desirable, it is unavoidable, because the oil would not otherwise combine with the metallic oxides in a concentrated form. But it is decidedly undesirable, because it endangers the quality of the boiled oil by darkening and charring it, and by giving it too heavy a body; because the drier lacks uniformity, and the oil itself cannot be uniform, as a fixed percentage of such un-uniform drier is added each time. Furthermore, by this process an excess of metals are dumped into the oil, only to act as a chemical bonfire to burn up the paint; for the drier prepared in this manner, as high as 10 per cent is generally introduced into the raw oil, which is again heated to 240 degrees F.—and the commercial boiled oil, with which the trade is familiar, is the result.

METHOD OF PRODUCING WOOD OIL.

The wood oil tree is found anywhere within 1,200 miles of the coast of China, between latitudes 25 and 34 degrees north. The cultivated tree begins to bear between its third or sixth year, according to the locality and richness of the soil, says Consul-General R. B. Mosher, of Hankow, China, and continues to bear for about ten years. The fruit is about the size of a small orange; the hull contains five segments, and the inside husk contains three fibrous partitions each having a triangular seed about the size of a hickory nut. The meat is white, contains about 25 per cent of oil, and has the odor which is so pronounced in the oil.

The nuts are gathered and parched in iron pans over a fire,

thus opening the husks. The seeds are then ground between stone rollers, the resulting meal being pressed by means of power obtained through the use of wedges and the weight of heavy stones. The oil is collected in vessels, is heated moderately (it congeals in cold weather), and strained through coarse grass cloth. If heated too much it produces a dark-colored instead of the light straw colored oil. It is placed in vats in the open air, and drained into plaited baskets lined with putty and varnished paper, in which it is sent to the market.

At Hanyang the dealers expose it further to the light and air, the clear oil is drained off, and the residuum placed in shallow vessels, where it lies for a time and is again skimmed. The remaining mull is sold to petty dealers in Wuchang, where it is said to be further precipitated and skimmed, the oil thus obtained being sold to boatmen for use on their boats. The Hanyang merchants have meanwhile disposed of their clarified oil to foreign merchants who ship it immediately. It is said that, if exposed to light or heat, the oil will continue this precipitation for years until it becomes as clear as water.

In winter the process is somewhat different. Tung oil congeals at 37 deg., and will not precipitate under 60 or 70 deg. In cold weather it reaches Hankow in a congealed state looking like yellow axle grease. It is then brought to the foreign merchant, who has it placed in a large tank through which are run coils of steam pipe. It quickly liquefies, and the muddy sediment drops to the bottom of the tank. After a day or two it is drawn off into barrels through stopcocks placed at different elevations in the side of the tank, to avoid the muddy collection at the bottom. It is said that all this precipitation is due to crude methods of manufacture, and would be avoided if treated in a modern way.

The oil is used on native boats, water buckets, and woodwork of all kinds, giving them a bright appearance and making them impervious to moisture. It is also used as a dressing for leather, a varnish for fine furniture, for soap making, and with colors for painting.

Of the wood oil reaching Hankow about 50 per cent comes from Hunan Province, 35 per cent from Szechuan, and 15 per cent from Hupeh. The total exports from Hankow were \$2,083,000 in 1909, and in 1910, \$4,340,000, of which latter the United States took about one-half.

The peculiar odor so noticeable in wood oil exists in the freshly extracted oil, and to a less degree in the meat of the nut itself.

MORE TURPENTINE, BETTER METHODS.

Interesting information relative to improved methods of turpentine chipping is imparted in Bulletin 90, Forest Service, United States Department of Agriculture. The results of the findings contained in the bulletin, based on experiments made in the South to determine the best method of obtaining the largest and most profitable yield of turpentine, show that the net yield of dip turpentine per pound is seven times greater than that of scrape, and the general distillation of spirit of turpentine to be one-half as much as is obtained from the scraped product.

"Taken as a whole," the bulletin states, "the chipping experiments appear to demonstrate conclusively that if turpentine operators will adopt the methods which have now been proved to be practicable they will substantially increase the yield per crop of crude turpentine. The results of these studies taken in combination with the results already demonstrated as following the substitution of the cup for the box point toward a revolutionary change in the turpentine industry."

As a result of the experiments the Forest Service will institute turpentine experiments in the Choctawatchee National Forest in the effort to turpentine the timber.

When lettering on a dark ground, add some aluminum to a white or light paint.

CARETAKING OF THE AUTOMOBILE BODY FINISH.

The automobile engineers and garage foremen and certain writers unacquainted with paint shop practice and varnish requirements, are going cheerfully about with some fearful and wonderful advice relative to the caretaking of the automobile finish. As a matter of maintaining to at least a reasonable extent his reputation for honest workmanship the painter owes it to himself and to the integrity of his business, to offer to his customers certain necessary information counteractive in its nature to the mis-information which the aforementioned amateur varnish doctors are distributing broadcast.

To begin with, he should understand, and, in fact, does understand, and should not hesitate to try to make others understand that it injures a fine and brilliant surface of varnish to dope it with any sort of oil, either drying or non-drying; that to rub it with waste or cloth is likewise harmful.

Varnish is a very delicately organized commodity, with something pretty human in its make-up, and it does best, under decent conditions of service, if left alone to live its life in peace and cleanliness, which latter state is maintained by frequently washing the car with cold water worked over the surface with a soft wool sponge, or flowed gently on through a hose, the surface, in conclusion, being lightly dried off with a fine, but free wash leather.

On the theory that too much medicine kills the patient the finish on the automobile requires, so long as the lustre and brilliancy remain high and the film unfractured, a cold water bath at the end of the day's run, or whenever the surface becomes cast over with dust or dirt accumulations. Oils and so-called cleaning compounds cannot possibly be used without an erosive effect upon the varnish, and whatever fraction of lustre they may apparently impart or restore to the surface, it is at best only temporary. Better an occasional fresh coat of varnish with its attendant sharp, clean lustre, than a foggy and continually be-smearred surface under which the color remains an undistinguishable factor.

Make the automobile owner—and, if possible, the chauffeur—to know something of the sensitive temperament of varnish. Impress upon him the fact that economy in the use of the car embraces fair treatment for the finish which treatment stipulates, primarily, that artificial stimulation of the varnish should be resorted to only when the natural wear and tear has taken its vitality and its natural lustre everlastingly out of it.

BENZOLE.

Benzole is the greatest penetrator and solvent of rosin and other gums known, says Mr. Dewar. In conjunction with acetone it forms the solving agent for paint and varnish removers. Again I would emphasize the fact that it must not be used in any but the priming coat for new woodwork, on account of its penetrating and solving qualities, which makes it so valuable in the priming coat. If placed in the second or any subsequent coat, the upper being exposed to the air and carrying the active agencies to aid in drying it, it would in all probability become set and form a film.



Design for Panel Ornament.

THE GLUE TANK.

Until recently this appliance was the crudest, the meanest and most neglected in the long list of equipment required in a wood-working establishment.

The first improvement was to put a cover on the glue cooker and provide it with a stirring rig.

But though the article had merits, it could not reform the wasteful habits of the glue users, and the result was that in many places where these new cookers had been installed the condition of this glue cooking appliance was soon as frightful as had been the aspect of the old open cast iron glue tank. And quite often was it found desirable to return to the old steam-jacketed cast iron kettle, because this old cast iron glue tank was usually as serviceable after 10 or 15 years' use, as it was on the day it was installed.

Some other features are worth mentioning, as for instance the construction of the outlets through which the glue is drawn. Special arrangements have been made to make the outlet in the inner tank an integral part of the tank itself. It is constructed in a manner to prevent impurities going through, while at the same time the opening is large enough to allow a copious flow. The shaft of the stirring rig being hollow a thermometer has been inserted, having the bulb at the base of the shaft, and in that way making it possible to gauge the temperature of the glue liquid in the glue itself and up to the last drop of it.

Wherever desired the glue tanks are still delivered made up in such a way that the entire inside tank as well as the entire outside tanks are made from cast iron, galvanized if preferred. A desirable combination seems to be to chose a one-piece cast iron outside tank and a built-up copper inside tank, in which the bottom is cast and a riveted shell fastened to this bottom.

Usually copper is preferred as the material in which to dissolve glue. This for the reason that glue does not seem to effect copper or brass. Where iron tanks are used, it is usually found, especially in the beginning, that the glue will react on the iron, and the result is that the glue gets a darker color. There are two or three ways in which this might be overcome. The most common way is to either galvanize or tin the inner glue tank. This usually lasts for awhile, but when some time has passed, it is necessary to repeat the galvanizing or tinning operation.

With regard to shape or form, practice has shown that it is better that the height should exceed the diameter. A high tank with a small diameter is decidedly preferable to a wide and shallow tank; especially for the reason that the rig, if properly constructed, can work better in a tank where the height exceeds the diameter than in a tank being low and wide.—From Glue.

GLUE PRIMER.

Glue is animal matter, the chief sources of which are bones and trimmings, cuttings and fleshings from hides and skins. Sinews, feet, tails, snouts, ears and horn pith are also largely used. The various parts from cattle, calf, goat, horse, sheep, pig and rabbit all yield glues having peculiar properties.

Crude glue is the raw material put in condition for boiling. It is necessary that this be free from foreign matter. Glue manufacturers obtain the jelly by boiling the crude glue, and after drying, this jelly is what is commonly known as glue.

Glue should be prepared by one man, in large modern glue cookers, equipped with heat controllers. Every workman's bench should be provided with a glue pot, which should be the exclusive care of the man working at that particular bench, and this glue solution should be guarded jealously.

It is imperative that joints be properly fitted and correctly clamped. A properly prepared joint, made with inferior glue, will be much better as regards holding power than one badly fitted, even if the glue used is everything to be desired.

Great care much be exercised in not applying the glue too hot,

or all of the glue solution will be absorbed by the wood, leaving a thin, inadhesive coating of glue at the surface of the joint, and this can only hold a very limited time. It is necessary to warm the stock to be glued, yet great care should be exercised that the stock is not overheated, otherwise it will burn the glue and destroy its adhesiveness.

BETICOL.

This glue, which is the result of prolonged researches, has now been brought in the market in Germany through the largest glue concern on the continent. Compared to ordinary animal glue the following advantages are claimed for beticol:

It is not necessary to soak, or boil, or cook this glue. Simply stir it up in cold water and it is ready for use. It does not form a jelly; it remains fluid in any consistency and will remain in a fluid condition for months without spoiling.

On account of the special process underlying the manufacturing of beticol, this adhesive is more flexible than ordinary animal glue and will for that reason not have the tendency to come off in flakes as does ordinary animal glue.

Compared to fish glue it has the advantage that it is sold in the dry form.

Compared to vegetable adhesives, beticol has the advantage of the superior strength which is conceded to animal glue.

Loss through fermentation, molding, drying or the formation of crusts is absolutely prevented, as this new adhesive is only prepared as it is wanted and as the substance from which it is made in connection with the manufacturing process prevents any deterioration through fermentation or the like.

CLEANING ENAMEL LEATHER HOODS.

The maintenance of the brilliancy of the enamel leather hood of a motor carriage is often a matter of difficulty. As the hides generally used for the purpose are specially dressed to be supple, and after coated with a japan and stove enamelled, any oil or grease applied destroys this enamel, and water gets into the leather. Comparatively new motor carriages have been found with the inner roof lining soaking wet when running during rainy weather. Enamel leather hoods should be carefully washed with clean water, and dried with a chamois leather, and afterwards rubbed up with a clean, dry cloth. Where the folding creases show, it will be sufficient if a little liquid harness composition is carefully rubbed in and polished off with a soft brush and cloth.

WEAR ON TIRE RECORDS.

	Per Cent.
Ordinary wear and tear	37.1
Damage by nails, stones or pieces of iron	29.4
Damage through insufficient inflation	17.3
Neglect of large cuts on the tire	4.9
Small cuts on the tread	4.3
Damage through rusty and dented rims	3.5
Excessive use of the brakes	1.8
Cutting of the cover through security bolts not being tight..	1.5
Damage caused by contact of the tire with oil2

IT SOUNDS GOOD.

Racing automobiles is now named "scientific experimenting," and it is sought to make application to the Carnegie Hero Fund Commission for hero medals for meritorious actions under hair-raising conditions.

As racing is now scientific experimentation, why not publish with the winning records, the list of killed and wounded, so that the thing shall be truly scientific by including all the facts?

From Ordinary to Touring

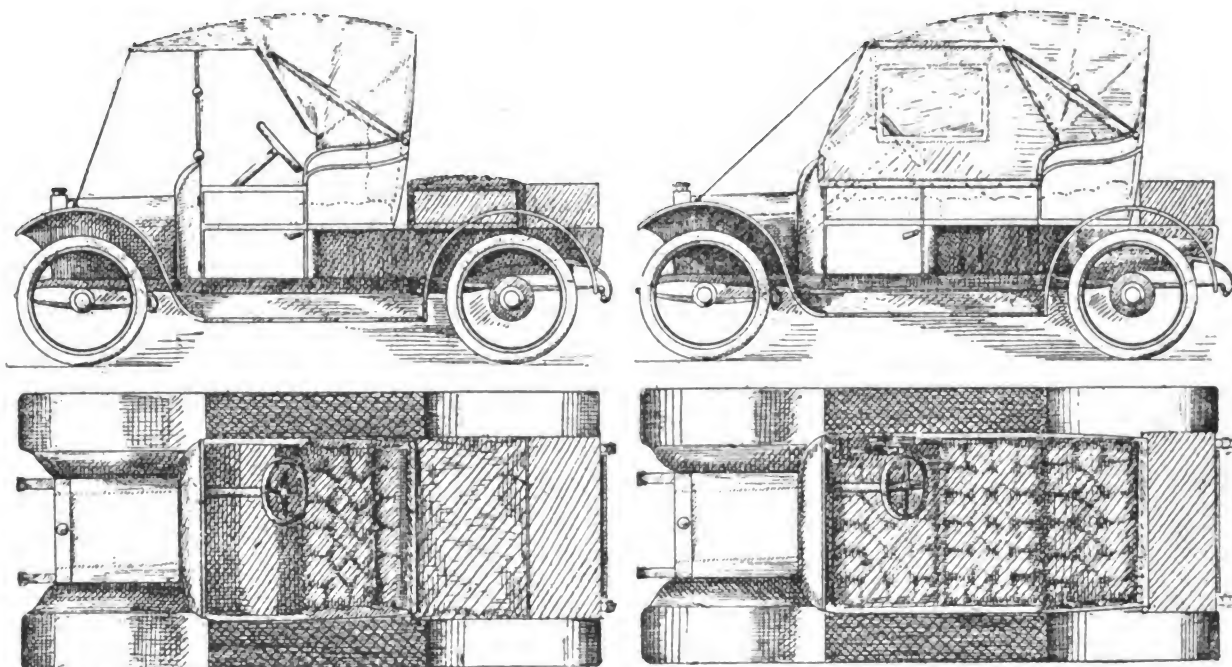
The object has been to devise a simply-made body, the design of which will permit of the introduction of a new piece without destroying the character or harmony. To arrange this has necessitated the scrapping of some of the usually accepted ideas of body construction, and to design a carriage which will give satisfaction to the builder and the user.

The sides of the body are nearly straight, the seat only being shaped and slightly tapered towards the rear part. The front coned dashboard is slightly tapered towards the bottom, about half an inch on either side, to prevent the doors looking as though they inclined inwards at the top. The boot sides are made as wide as the chassis frame will allow, the distance between the clips on the rear springs fix the width, the body can be lifted off or on without mutilation. The doors are right-angled and the lock is secured on the underpart, with extra security locks inside. The seat and Cape hood are made as one item and independent of the remainder of the body. Particular care has to be exercised in the construction of the seat, the weight of the hood and curtains has to be carried and flimsy construction of any

the contents are covered and protected by a waterproof cover made and fitted for the purpose.

When it is desired to alter the carriage from the running to the resting position, the rear box is emptied of the side curtains, rugs, and cushion, and removed; the front seat is transferred to the position at the rear and the box is placed between the seat and door and secured. Security bolts on the sides of the box are provided corresponding to those on the rear seat and the doors. The door on the off side is practicable, and encloses the side levers, the spare tire, etc., being stowed away in the boot at the rear (the side being removed to show the position). The gasoline tank is also carried at the rear. These arrangements leave a large space under the front portion of the seats, and space on either side for spare gasoline, oil, generators, etc.

To complete the arrangements for converting the car into sleeping berths, cushions and supports are necessary, says The Motor, (England). The bottom of the "box" between the seat and door is double, hinged at the front edge and divided in the centre. When opened, the flap rests on a ledge on the inside of the door and on supports on the footboard. The division in the



kind or a makeshift character will only end in dissatisfaction. Two strong stays, running right across the body, one close to the front edge of the seat, the other at the rear, must be firmly fixed to the foundation framing; on these must be turned flaps on the level of the boot sides, with holes in them screwed to take half-inch set-screw bolts. On these the seat rests and is secured; the ironwork carrying the hood must come down to the seat board and in flaps; worked in the solid, must be holes corresponding to those in the stays underneath. When the four set-screws are in position, it will be seen that the seat and the hood fittings are firmly secured to the foundation framing, and are not liable to get out of order.

The box immediately behind the seat (Fig. 1) is secured in a similar manner by four set screws having a position relative to those in the seat, but having also four other holes provided to correspond with those on the body at the front, so that when the positions are reversed, as shown in Fig. 2, the seat and hood will be equally secured in either position. The box secured behind is only the bottom and two ends; there is not any top or sides;

centre is to permit of the near side of the car being used as a couch while the car can be driven, the flap on the off side remaining on the box. The spare cushions are carried in the box. The dotted lines show the arrangement of the back squab and the shape and size of the cushion, and how, by having the back squab a loose fitting, it can be made a suitable headrest. The seats and cushions are of necessity flat, to serve the double purpose, and if they are carefully adjusted to the special requirements of the passengers for height, etc., they can be made very comfortable.

The hood has been designed of a suitable size to answer equally well in both positions, the windscreen being suitably jointed, to stand in any position or fold down, over the bonnet in front. The necessary fittings for holding the screen securely to the body require to be carried out in a substantial manner, and, for preference, underneath the coned dash. The box on the rear of the body can be made of any size suited to the special requirements of the passengers, a reduction in size being accompanied by a corresponding reduction in the space under the seats in the interior.

Automobile Department

UNCONVENTIONAL MOTOR DESIGNING.

We extract some of the salient passages appearing in a communication to *The Motor* (England), that blaze a new path of thought. It will interest those who believe the last word has not been said or written on engine designing, and well points out why progress cannot very well evolve when the bank balance is constantly grumbling at the expense and asking where's the use. Let well enough alone.

While ostensibly and theoretically the search for improvement in motor design is supposed to be going on the fact is, little change is taking place. One reason for this is the cost of scrapping the patterns of the sacred Thing-that-is for the sake of any advantages promised, however obviously those advantages may be demonstrable. And still another reason is that the conventional Thing-that-is serves its purpose tolerably well, or obviously, it would not be conventional.

Of course, two-stroke development may well occasion great improvement; but two-stroke practice is something apart, and only for the adepts to meddle with. Let us see, rather, what can be done with the four-stroke of every-day use. There it is, with its conventional valve pockets on one or both sides, its one or two camshafts, the whole of its valve gearing in all essentials just as it has been these dozen years; its crank chamber panelled with inspection doors or not, as the case may be; its cylinders cast in pairs or units; costly to make, repair or replace, and, worse still, requiring anything from a day or a week to dismantle and re-erect. Surely such a design must be all wrong, however well the creature happens to run.

Then to the radical cure. To begin with, strength for heavy duty is fundamental; but not necessarily weight. Weight defeats its own object, since it has to propel itself. Then we need the compactness, the cleanness and pipelessness of the monobloc system, without its inherent defect of having to scrap the whole on account of a single flaw in a single part of the mass. That is why, in their realization of this desideratum, the original Napier "elephant" of the first Harmsworth Cup, and the flange-butted Maudslay of to-day, are in a class by themselves, superior to their contemporaries.

The essentials are strength and monoblocism; but these do not necessarily connote casting throughout the mass. Cylinders and their heads are, in fact, the only parts that need be castings, the reason being that nothing holds lubricant like cast iron, or stands heat so well without distortion. It becomes, then, competent for us to build our motor in a frame composed of angle steel, welded to an upper horizontal plate, and a similar diaphragm plate some six or nine inches below it, the said plates having circular openings, into which the cylinders—which would be appropriately tapered at these points, that is to say, at the top and in the middle—are pressed into place. Thus, any one of these cylinders that may at any time develop any defect can be knocked out again and replaced; the sides and ends of the construction can be panelled in with some light sheet-metal, to form the water jacketing, which, as panelling, is obviously removable when you have traced that otherwise unaccountable moodiness of behavior and inequality of power rendition to its true cause—dirty, limey jacket depositing; and there will be no weeping into the crank chamber from the bottomplate, for are not the cylinder trunks tapered just there, and pressed in? Or, to get the best refinement out of the whole system, the top and ends of the motor frame, down to the very attachment of the base chamber pan, may be formed of one piece of sheet steel plating, flanged up in-

wardly and downwardly at the edges to take the panelling and to assure rigidity, and forged rectangularly thus $\text{—} \text{I} \text{—}$; with the lower or diaphragm plate, which grips the cylinder trunks, welded or even bolted in place. From this plate—so greatly has the art of forging been simplified and perfected—a vertical plate would depend, to suspend the center bearing of the crankshaft, while the end bearings would similarly be carried in disc plates, American fashion, bolted to the end plating of the motor frame. Again, through extensions of the lower flanging, transverse steel tubes might be inserted as an excellent substitute for the usual cast horns; while the base chamber pan itself, on which no strains are ever imposed, might be molded to shape out of very light sheet steel, and have oil sump screwed or riveted to it at any convenient point.

On this system of construction alone the whole motor would come out at anything from one to two pounds lighter per horsepower, be stronger and more proof against accident than any cast iron and aluminum construction, and be as cheap, if not cheaper, to produce in smaller series and more numerous sizes. For your cylinders would be your only details requiring foundry patterns and casting or machining, the rest being mere forge work to accurate templates, which could be so adjusted to half a dozen different dimensions.

So much for the frame, and what is usually the mass of the motor. Now for the cylinders and valve gear. Each of the cylinders might be cast, itself as a liner, as we have seen, but with a water-jacketed head, from the underside of which four or five flanged nipple-like water connections (also inserted in holes in the top plate of the motor frame) would enable ample water circulation to take place. To save piping, too, the heads might be cast with mutual water connections, simply united by sheet rubber, lapped round and clamped. In this way there would be a single main water outlet and inlet. Thus all the advantages of the monobloc, in the way of single water jacketing for all cylinders, as well as absence of piping, would be obtained, as well as others which are for ever unattainable in cast-throughout practice, while, for further security, the cylinder heads could each be attached through lugs by a couple of short bolts screwed into the top plate of the motor frame.

As to valves and valve gearing, the mechanical simplicity and physical efficiency of the overhead system makes it impossible to look beyond for any other. And noting here very carefully the fact that amplitude of valve area is one of the chief secrets (a very open one to-day) of motor efficiency, we have the choice of diagonally mounted valves, transverse to the cylinder heads, adopted by the Ariel Co., Detroit, and later readopted by Clement-Bayard for their dirigible and racing motors. That should be good enough to follow; but I stated a choice, which infers another. That other is a concentric valve. Any type, it scarcely matters, though some are better than others, and on most of them the patents have run out. Why, if the type is so good? Why have they not been adopted universally? Fashion alone, let me assure you; fashion that, set by a few big firms, rendered variations from their convention unsaleable; fashion that is now having its silly neck broken in the rush for improvement and weight lessening, occasioned by aeroplane motor design.

For the unassailable fact is that not one of these concentric types of valve has ever failed. Poor Giuppone, in his motorcycling days, and Roux rode with Bailleul valves nearly 5,000 miles and never had to touch them. The even earlier Selbach never went amiss. The same type has been the standard in the Parsons marine motor (today one of the two or three most important Brit-

ish makes) since its first appearance eight or nine years ago, a tolerably severe and world-wide test of efficiency. And, latterly, regard the supreme exemplary test of the type in aviation in the case of the Panhard motor. Now it is known that there is no test of a motor so severe as its use for aviation. There is literally no "let-up" from start to finish, until the final vol-plane, or obviously, the aeroplane would fall.

Yet one of the most successful aviators at Rouen was M. Marius Dubonnet, of motorboat racing fame, on a Tellier monoplane, fitted with one of the new concentric-valved Panhard aeromotors; a monoplane of which the best that can be said is that it is well and strongly built, but one that might be much better designed, and needs the most powerful and utterly reliable motor to make it fly at all. Yet Marius Dubonnet, if I remember aright, flew over 200 miles non-stop. And since the obvious axiom is no valve, no motor, the equally obvious conclusion is that the Panhard concentric valve pulled the performance through. Admittedly the finest other aero-motor extant in France to-day, and the greatest favorite with those aviators who are not obsessed by the rotary motor craze, is the Dansette Gillet, which is also fitted with a concentric-valved motor of another model. Need one then ask for surer proof of the merits of the type, especially as it peculiarly lends itself to actuation by an overhead camshaft?

Well, there is little or nothing further to say concerning the merits of the constructional system outlined in the foregoing paragraphs; indeed, it would seem that they speak for themselves, and they are at least novel, as well as sound engineering that contradicts no previous motor experience, nor embodies any detail not long since proved thereby. The only question then left is that of placing accessories on such a motor frame. As if little steel platforms could not be forged or bolted on the frame mass for pump and magneto in the same place as they have been hitherto cast upon it. As if the magneto could not be carried on the overhead camshaft, leaving only pump to be thus provided for.

IN FOR TROUBLE.

The English critic is viewing our essays in handling the freight problem, and he has somewhat to say that will excite interest. The article is copied in part from *The Motor*:

Quite three-fourths of the American business vehicles have engines beneath the floorboards, which illustrates the recognition of the theory—undoubtedly correct from many points of view—that the commercial vehicle is intended to carry loads and that, this being its purpose, as much of the available space as possible should be utilized for it. In one notable instance, where electricity is the motive power, so fully is this idea carried out, that the whole of the platform above the wheel is devoted to the load, while the driver is, as it were, hung out on a bracket in front of and entirely outside it. In Europe, and especially in England, the practicability of the system has long been recognized and there are a number of well known and successful vehicles built on these lines, but conventionality has become and is becoming too strong, and popular prejudice has resulted in a more general opinion of the broad design of the touring vehicle. This tendency is now making itself felt apparent in the States, for, while most of the original pioneers of the American "truck" trade are producing cars of the bonnetless type, many of the large pleasure car firms, which are now taking up the large commercial vehicle, are introducing the bonnet design. In this, perhaps, they—or some of them—are wise, because those who are doing this are to a large extent copying European proved designs. Since there have hitherto been very few manufacturers engaged in the industry, there are, with these few exceptions, practically no firms in the States with any experience of commercial vehicle work, yet the American mind evidently rebels at the idea of the slow and sure development of all British firms which have attained any eminence in the industry, and the makers there are gaily putting through quantities of untried models which vary in number from one hundred to a thousand. Some of them—but

more particularly, their customers—are in trouble. In a few instances, as already mentioned, European design is being followed pretty closely, and this particularly in regard to the heavy class of from 3 to 10 tons capacity; there are one or two firms which are not afraid to put forward 10-ton vehicles as practical propositions.

Some of the heavy "trucks" which are being offered to the public are weird constructions indeed; thus, one manufacturer offers a three-tonner with a two-cylinder opposed engine of about 16 H.P. and another calmly puts forward a highpowered vehicle for the same load with a claim for 60 miles an hour from it. But it is in regard to the smaller wagons that the greatest crudity is to be found. The makers of the large-load wagons have for the most part recognized the need for special design and construction, but, when it comes to the "1,000-pound truck" and the ton vehicle, we have the crudest propositions in the list. Air-cooled engines with friction drive and small section solid rubber tires, or cheap pneumatics are quite common, and, as with many manufacturers here, who are now attempting to enter the small van trade, the chassis of some of the cheapest and crudest and flimsiest of the "runabout" cars appear to be employed, with little if any alteration. With these, lowness of first cost has been the first consideration, and the skimping of parts and the employment of low grade materials have been necessary to attain the end. With us, we have long ago learned the lesson that what can be made to "do" for a touring car will not do at all for a commercial vehicle, and that, in the latter, high quality of material and full strength of parts are absolutely vital first considerations. This lesson our Yankee cousins have yet to learn, and the inevitable learning of it will, I anticipate, heavily set back the development of the commercial vehicle in the States, in about a couple of years' time, for, although the American business man is more ready to invest in new and untried productions than his prototype here, he is no more enamored of "breakdowns," or of having his goods hung up "five miles from anywhere," than are our commercial houses on this side of the herring pond.

With this fresh and almost frenzied attention to the "truck" by manufacturers, there has come a sudden spasm of interest in it on the part of the press, and new and special journals, devoted solely to its interests, are being projected, while established motor publications, which, for years have ignored the commercial side of the industry—save for an occasional paragraph—are devoting "sections" to its interests, and column after column of matter to its exploitation. A perusal of much that is written shows how intensely "new" both manufacturers and writers are to their subject, and what entirely fallacious lines of argument and policy are being followed, in many cases, by both. All the mistakes of our own earlier years are being repeated, as, for instance, the very early error—which some of our agents have not even yet quite recanted—of attempting to employ secondhand and obsolete touring car chassis for commercial work, and I was much astonished, a few weeks since, to read in the columns of the "Horseless Age"—which I have always looked upon as a practical and solid paper—a long article, seriously and in detail recommending "made-over touring car chassis," i.e., "overhauled" ones, as being eminently suitable for commercial work! Other indications of a total lack of appreciation of the subject, by both trade and press, are to be found in the many references to speed in connection with commercial work, and to spectacular demonstrations of the capabilities of new types in the carrying of heavy loads at high speeds without breaking down, a sort of "stunt" or piece of gallery play—calculated to create an entirely wrong impression of the motor vehicle for serious work, and also calculated to lead to a vast amount of abuse of their vehicles by users. Another type of show performance, which seems to be common, will also induce trouble in another direction, and that is in overloading the vehicles, for constant and full publicity is given to such performances as carrying over a given route loads of about double the rated capacity of the vehicle—a short-sighted policy which will ultimately lead to a lot of trouble.

Management and Care of Leather Belts

The first thing in order will be the selection of a leather belt; and when we consider that all makers make good belts, that there are no particular secrets in the belt-making business, and that in order to get the very best we must take every advantage of the small details in construction, it stands every engineer and belt-user in hand to get all the information available; for we must remember that the percentage of good hides does not run very high, that all are bought to go into belt stock of some kind or other, and that some one must buy the goods that are not quite up to the standard of belt excellence. It is very evident that no man wants anything but the best when he is paying for the best, and it is also evident that no maker is going to say he makes inferior goods; so, therefore, we must read the quality by what is in sight, and in the judgment of leather that is already made up, the proposition resolves itself into a very hard one.

The two principal things left for an opinion to be based upon as to quality are the relation the pieces that constitute the laps bear to the hide from which they were cut, says R. A. B. in *Wood Worker*, to whom we also credit the illustrations. They should, in belts running from 18 in. to 36 in., be cut from the center of the hides, or should be what is known as "center stock." Of course, all belts should be center stock, but where they are very narrow or so wide that one hide will not be wide enough to make a lap, then there is always a lot of narrow stock worked in that cannot always be strictly center.

The next thing to look out for is brands that are so deep that they destroy the life of the leather and will cause it to break after being used. Then look out for the length of lap. If this is too long, you will know that it runs into the neck, for about all that it is possible to get out of average hides, and still leave nothing in that is not first class, is 54 or 56 inches. Ordinarily, you can tell if a lap is center stock by the marks that run down either side of the backbone; they will be usually a little darker than the rest of the belt. These marks or streaks should be in the center of the belt. The principal objection to neck leather is that it is liable to stretch excessively, and on this account it will put too much load on the piece immediately opposite in a double-ply belt, for the point of one side is in the middle of the lap on the other side.

Next look out for holes, which will usually be found so nicely plugged as to escape detection unless subjected to the most

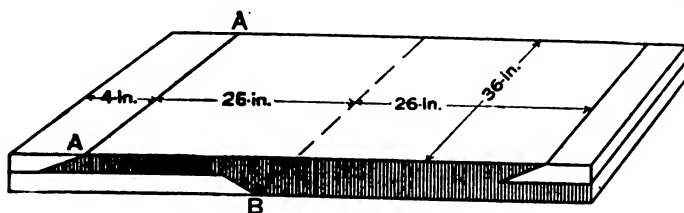


Fig. 1.

careful examination. Next in importance is to buy a belt that has already been filled with some good waterproof dressing. It is quite likely that to buy a belt that has been filled means to buy one that perhaps has some bad leather in it that should be seen in a dry oak-tanned belt, and also that the adhesive power that the filled one possesses over the one not filled is, first and mainly, "it is filled when you buy it with a preparation that does not injure the leather in the least," and the preparation you will fill it with, for it will be filled, will be engine oil and water, a combination that will ruin any belt made, and also get it, in six months, into a condition that will make a permanent repair with glue impossible, for machine oil and moisture are strangers to glue, and will ever be. More good belts are ruined by being

soaked with engine oil until the points come loose, and then pulled out of shape, than from any other cause.

Now we come to the building of the belt, and we will notice only such points as interest the engineer or buyer. The first thing is to see that the laps are of uniform thickness, so that the belt will run quietly, and it should be absolutely straight when unrolled on the floor. If it has a long, graceful curve in it, look out, for it will not run straight on the pulleys until it has stretched straight, and by that time one of its edges may be ruined by coming in contact with the floor or some other obstacle. Next, notice how long the leather is from which it is made. It should not show more than 52 inches, and then there will be 4 inches hidden by the point that is out of sight. Then see that the joints are broken properly. For instance, find the center of any piece of leather on one side of the belt and then look on the opposite side and see if the joint is right under your center mark. It

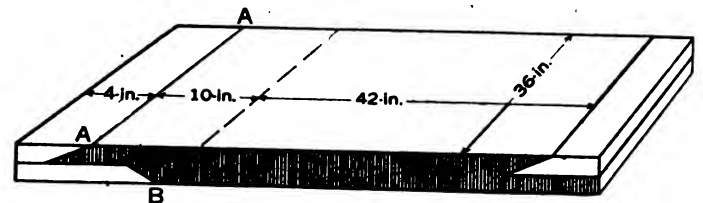


Fig. 2.

should be, by all means, for right here lies the most important thing about the construction of leather belts.

A belt whose laps are all the same length, and which has all its joints broken correctly, will put the same load on the glue throughout, and that is what must be done in order to get the best results, see Fig. 1. Here we have a belt that is 36 in. in width and is double-ply. Now suppose there is a draft of 9,360 lbs. on this belt, that from point B is 26 inches and that the points are 4 inches long. Now we have 26 inches plus 4 inches, plus 4 inches, plus 4 inches, times 36 inches, for the number of square inches in the glued joint. This equals 1,224 square inches, the total pull on the belt, divided by 1,224, will equal the load on each square inch of glued joint, and will equal in this case 7.65 pounds.

Now, instead of assuming distance A B, in Fig. 1, to be 26 inches, let the lower joint get out of step with the upper ones, and conditions get vastly different. We will suppose that the dimensions are as given in Fig. 2, as was the case with a new belt that was measured less than one month before the observation was made, and we have the following: Joint A B is now only 10 inches, and we have 10 inches plus 4 inches, plus 4 inches, plus 4 inches, times 36 inches, which equals 648 square inches, and the load on the joint is now 14.44 pounds.

You will readily perceive what an important part in the life of the belt, and the life of everything around the belt, as far as that goes, the proper breaking of the upper and lower joint is. Of course, the beltmaker will tell you that his glue is just as strong as the leather itself, and he is about right as long as you keep the belt free from oil and water; but when the belt becomes filled with oil, the glue rots and loses its strength much faster than the leather.

No good belt needs any posts along the sides to make it run straight and stay on the pulleys. If the pulleys are in line and the belt straight, it will run straight. All belts should be made to run perfectly straight on pulleys, first, on account of the local advertisement for the man who has charge of them; second, if they do not run true, they will be on the floor or wrapped around the shaft in a very few minutes should they ever slip.

Another very important thing in the care of belts that carry

heavy loads is that if any of the points do come loose so far back that they will not return to place without putting on the clamps, put them on by all means, as the restoring of this point to place means that you will still retain in service all of your belt, which you will not do if you glue it down where it is and thereby cut one side completely out of service.

ALWAYS SOMETHING NEW.

W. C. Durant, of the General Motors Company, and Racer Louis Chevrolet, a co-worker with Durant in the manufacture and exploitation of fast cars, will sever their other business connections and establish a great factory in Detroit for the manufacture of a new high priced car, whose chief distinctive feature will be an engine perfected by Chevrolet, assisted financially by Durant.

Last winter at a garage on Grand River avenue, Detroit, Chevrolet experimented secretly with a new type of engine that is to be the chief selling advantage of the new car. Chevrolet is of French-Swiss birth. He came to America in 1900 after securing in France a complete education in automobile construction and driving. Here he made a record as a racing driver and expert. As a skilled mechanic he was retained in a business way by Durant.

The new Durant-Chevrolet car, it is stated, will be of high grade. Durant will move to Detroit, though he may retain his interest in the carriage works at Flint. For some time, it is said, he has been gradually withdrawing from the active management of the General Motors Company.

NOVA SCOTIA BUSY.

A prominent carriage manufactory at Kentville, Nova Scotia, recently commenced building motor cars and vehicles of one kind and another and has already booked 40 orders. With this encouragement the company will at once enlarge its works. The engines and some other parts are imported from the United States, but the woodwork and the general construction will be done at Kentville. Until this year motor trucks have not been in use in Nova Scotia. Now a number are in use and seem to give satisfaction.

NEW DIRECTORS.

Philip S. Tuley has been chosen director of the Kentucky Wagon Manufacturing Company, Louisville, Ky., to succeed John Stites, who declined re-election. Other directors were re-elected, as follows: W. C. Nones, S. M. Nones, John Marshall, J. C. Hughes, A. L. Schmidt, W. S. Speed, John Glazebrook and L. Alley.

A NEW WHEEL.

Stockholders of the Shade-Fowler Manufacturing Development Company, organized to manufacture an automobile wheel, elected J. O. Howard, of San Antonio, Texas, president. Mr. Howard says that the company plans to erect a factory in San Antonio to manufacture wheels.

ABSORBED BY FLINT.

The Joliet Wheel Company, late of Pontiac, Mich., whose plant was destroyed last spring, and which company has decided not to rebuild, will become a part of the Flint Wheel and Buggy Company, the Joliet firm having joined with the Michigan company.

PATENT WAGON LOCATION.

Aurora, Ill., may become the location for a factory for the manufacture of a patent combination hay, stock rack and wagon box, which has been patented by C. L. Clark of DeKalb.

HURRAH FOR THE QUEEN CITY.

Cincinnati is the near-largest carriage center in the world. This is a proud distinction. The recapitulation of the vehicle interests of Cincinnati is told in the following:

Sixty carriage and accessory factories.

Two hundred and fifty thousand vehicles annually.

Twelve million dollars' aggregate value.

Fifteen million dollars invested capital.

Eight thousand men employed.

The carriage industry has increased in volume from year to year. Cincinnati builders devote their attention mainly to the manufacture of light pleasure vehicles, in prices varying and in all grades. A notable feature is the continual improvement each season in style. This stimulates the trade and continues to call the attention of the dealers.

As to the accessory and supply people, Cincinnati is a large center and an important factor in the market. A large number of jobbing houses and manufacturers' agents add to the convenience of the manufacturer. Cincinnati is recorded as an important center for carriage and wagon supplies. The trade in this line is a vast one. There is no reason why the carriage interests of that city should not continue to grow until the next few years will witness even a greater increase than the business now prevailing.

MORE BIG BUSINESS.

The General Motors Co., with headquarters at Detroit and Jersey City, N. J., filed articles of incorporation with the Secretary of State in Lansing, Mich. The company is capitalized at \$60,000,000. The first deposit, amounting to \$500,000, toward meeting the first installment of the \$15,000,000 five year notes, installment due October 1 next, has been made with the trustees for the notes, and the remaining \$1,000,000 will be on deposit before the maturity of the installment.

NEW BUGGY COMPANY AT ANN ARBOR, MICH

The Ann Arbor Buggy Co. is a new Michigan concern. T. A. Hoffman, who has been with the Butler Company, Butler, Ind., for the past ten years, has acquired a third interest in the company, and is in charge of the business as manager and secretary.

The company manufactures a large line of carriages, carts, pony vehicles and rural mail wagons.

CONGRATULATIONS!

News of the marriage, in Chicago, of Miss Elsie Gardner, daughter of Russell E. Gardner, St. Louis, Mo., to T. B. Watkins of Memphis, Tenn., has been received.



A Darracq motor coach on the Derby course; four cylinders supplant the four-in-hand.

SOUTHERN CARRIAGE MAKERS RE-ORGANIZE.

The Southern Carriage Manufacturers' Association was reorganized at the Selwyn Hotel, Charlotte, N. C., where were gathered representatives from all the Southern States. The meeting was quite enthusiastic and adjourned to meet again at Old Point Comfort July 12. At that time the organization will be made permanent. Charlotte is the logical meeting place for this association and there all its regular sessions will be held in the future as in the past. Old Point Comfort was chosen for this particular time because the Southern Buggy Manufacturers' Association meets there at that time and a joint conference is desired.

R. S. Barbour, of South Boston, Va., was elected president and H. A. White, of High Point, secretary of the temporary organization. The business represented by this association has grown within the past ten years from some dozen factories to about forty at present. These represent an investment of about \$5,000,000 capital.

The meeting was in a way informal, being held in private apartments in the Selwyn and the only matters discussed were of a routine nature.

Those present included Messrs. B. F. Taylor, of Oxford, N. C.; W. C. Heath, of Monroe, N. C.; J. R. Knight, of Franklin, Va.; W. B. Waddill, of Henderson, N. C.; H. A. White of High Point, N. C.; D. P. Hale, of Anniston, Ala.; A. M. Briggs, of High Point, N. C.; E. J. McCone, of Savannah, Ga.; Moyler, of Suffolk, Va.; W. T. Minor, of Durham, N. C.; H. R. Fischer, of Atlanta, Ga.; O. W. Kochtitzky, of Monroe, N. C.; R. S. Barbour, of South Boston, Va.; J. W. Anderson, of Rock Hill, S. C.

MAKING WAGONS IN CRESCENT CITY.

The wagon manufacturing industry has been a profitable business in New Orleans for many years, and has greater prospects for success now than it has ever had. For many years after New Orleans began to be a growing city, says a local paper, it never occurred to any one that wagons could be made outside of South Bend, or some such place. During the war wagons were made in homely shops all over the South. With the cessation of the war, and with the inflow of Northern-made articles, the wagon making abruptly came to an end, and the South bought from her old market.

It was only by bringing skilled craftsmen in the wagonmaker's art and by making the best possible wagons that the people of the South discovered that New Orleans could use as good hickory and oak and iron and steel as any factory in any part of the country, and that she had expert workmen, who knew every detail of the work. It began to be seen that no better wagons were ever turned out of any manufactory than were being made right in New Orleans, and then the tide turned. The wagon factories of the city are doing a magnificent kind of work, and are doing it well. All through the South the name of New Orleans on a wagon is beginning to be acknowledged as an equivalent of worth, and that of itself is an indication that the battle is won.

AUSTRALIAN COACHWOOD.

Coachwood is also known as lightwood or leather jacket. Growing chiefly in New South Wales, it attains a height of from 50 to 100 feet with a diameter of from 1½ to 3 feet. Soft and light in weight, it is considered an excellent wood for coach building—tool handles and mounts, is exceedingly tough and has special qualities which render it particularly suited for sounding boards, rivaling in this respect the well known Swiss pine extensively used by pianoforte makers and organ builders. This timber, coachwood, is often confused with an allied red wood, known as cork wood, which does not possess the excellent qualities of this timber. Locally it is extensively used for joinery, and general interior figures.

MOTOR VEHICLES PROHIBITED IN PRINCE EDWARD ISLAND.

Consul Frank Deedmeyer, of Charlottetown, writes that the recent 1911 session of the Parliament of Prince Edward Island failed to repeal the law which provides that any person guilty of running a motor vehicle upon any highway or other public place shall, upon summary conviction, be fined \$500 and in default of payment committed to jail for six months. This law defines a motor vehicle to be all motors, automobiles, or any vehicle propelled by any power other than muscular power, except such vehicles as run on rails and steam rollers.

TO MAKE STEEL AUTO TIRES.

Officers of the Gregory DeHart Cushion Steel Spring Tire Company are in St. Louis seeking a location for a factory. The company manufactures a steel automobile and motorcycle tire, which, according to promoters, will revolutionize the tire industry. The company will incorporate. Mrs. Marie Gregory DeHart, author and traveler, formerly a resident of St. Louis, is the inventor of the tire, while J. C. Crouch, formerly of St. Joseph, is to be president of the company. Mrs. DeHart says she has tested the tires for four years before making plans to manufacture them and the first ones she made are still good. The company decided to locate in St. Louis after looking over both St. Louis and Kansas City.

AN ENDURANCE TEST.

W. H. McIntyre Company, of Auburn, Indiana, intends to have two cars at the Four State Tour which starts from Indianapolis on July 12. One, the regular torpedo car, and the other, the one and one-half ton truck. The latter will be the official baggage car of the tour and will at the end of the run, which covers over a thousand miles, go on the road from Indianapolis to Chicago, from Chicago to Boston, then to New York, from New York back to Chicago, and then to Auburn, covering in all some 3,800 miles.

COLUMBUS CARRIAGE WORKS WILL OPERATE IT.

A statement has been made that the plant of the Melbourne (Ky.) Buggy Company has been taken over by the Columbus Carriage Works, who will operate it. M. C. McNamara and Felix Grice, both connected with the Phoenix Carriage Works, of Cincinnati, are the promoters of the new enterprise.

BIG DEAL IN HICKORY.

The biggest financial deal in the history of Hickory, N. C., took place when the Piedmont Wagon Works changed hands, involving more than \$400,000. The deal was engineered by J. A. Martin, and he and his associates were the purchasers.

RESTORATION.

The Belknap Wagon Works, Grand Rapids, Mich., is rebuilding part of its factory which was burned a month ago. The fire destroyed the boiler rooms and dry kilns. This part of the building is being built of brick. It will be completed in about thirty days.

HICKORY STOCK WANTED.

E. Zimmerman, Potsdam, Germany, is desirous of learning the addresses of concerns furnishing straight hickory wood stock. He uses large quantities, being one of the largest wagon makers in Germany.

THE HOTELS, THE MEETING PLACE, ETC., OF C. B. N. A., ATLANTIC CITY, IN SEPTEMBER.

The annual exhibition will be held on the great Million Dollar Pier, beginning with Monday, September 25th, and continuing throughout the week. The pier is strongly built, well lighted, has all conveniences, and is an ideal place for exhibition purposes.

The business meetings will be held on the Million Dollar Pier on the mornings of September 26, 27, and 28, commencing promptly at 10 o'clock.

Good hotels are so numerous (Atlantic City being a city of hotels) that we have contented ourselves with calling attention to a few of them, where the price per day would suit almost all of our members and the visitors.

THE OFFICIAL HEADQUARTERS

will be at the Marlborough-Blenheim. This hotel is conducted on both the American and European plans. This is a very fine hotel, well situated and near the pier on which the exhibition and convention will be held.

American Plan—Single room, with bath, one person, \$6, \$7 and \$8 per day; single room, without bath, one person, \$4, \$5 and \$6 per day; double room, without bath, two persons, \$8, \$9 and \$10 per day; double room, with bath, two persons, \$10, \$11 and \$12 per day.

European Plan—Single room, with bath, one person, \$4, \$5 and \$6 per day; single room, without bath, one person, \$2, \$3 and \$4 per day; double room, with bath, two persons, \$6, \$7 and \$8 per day; double room, without bath, two persons, \$4, \$5 and \$6 per day.

AMERICAN PLAN.

On the Boardwalk.

CHALFONTE. Without private bath, for one person in single room, \$3.50; in double room, \$4.50; for two persons in double room, \$6 and \$7; in extra large room, \$8. With private bath, for one person in double room, \$6; for two persons in double room, \$10; in extra large room, \$12.

TRAYMORE. Without private bath, for one person in single room, \$4 up; in double room, \$7; for two persons in double room, \$8 up; in extra large room, \$10. With private bath, for one person in single room, \$5 up; in double room, \$13; for two persons in double room, \$10; in extra large room, \$16.

DENNIS. Without private bath, for one person in single room, \$4 to \$5; for two persons in double room, \$7 to \$8. With private bath, for one person in single room, \$6; for two persons in double room \$10 to \$12.

SHELBURNE. Without private bath, for one person in single room, \$4; in double room, \$5, for two persons in double room, \$8; in extra large room, \$10. With private bath, for one person in single room, \$6; in double room, \$7; for two persons in double room, \$10; in extra large room, \$12. Also on European plan as below.

CHELSEA.—Without private bath, for one person in single room, \$4; in double room, \$5; for two persons in double room, \$8; in extra large room, \$10. With private bath, for one person in single room, \$6; in double room, \$7; for two persons in double room, \$10; in extra large room, \$12 to \$14.

St. James Place.

ST. JAMES. Without private bath, for one person in single room, \$2; in double room, \$3; for two persons in double room: \$4; in extra large room, \$6.

FLANDERS. Without private bath, for one person in single room, \$2; for two persons in double room, \$3; in extra large room, \$4.

SEA CREST. Without private bath, for one person in single room, \$2; in double room, \$2; for two persons in double room, \$4; in extra large room, \$4. Also on European plan, as below.

WILDE. Without private bath, for one person in single room, \$2; in double room, \$2.50; for two persons in double room, \$3.

New York Avenue.

NETHERLAND. Without private bath, for one person in sin-

gle room, \$2; in double room, \$2.50; for two persons in double room, \$3; in extra large room, \$4. With private bath, for two persons in double room, \$5.

Kentucky Avenue.

CARNIX-LA FONTAINE. Without private bath, for one person in single room, \$2.50; in double room, \$3; for two persons in double room, \$4; in extra large room, \$5.

Michigan Avenue.

ARLINGTON. Without private bath, for one person in single room, \$2.50; in double room, \$3; for two persons in double room, \$4; in extra large room, \$5. With private bath, for one person in double room, \$5; for two persons in double room, \$7; in extra large room, \$8. Also on European plan as below.

PENNHURST. Without private bath, for one person in single room, \$2.50; in double room, \$3; for two persons in double room, \$5; in extra large room, \$6. With private bath, for one person in double room, \$5; for two persons in double room, \$7; in extra large room, \$8.

Florida Avenue.

CHELSEA HALL. Without private bath, for one person in single room, \$2; in double room, \$2.50; for two persons in double room, \$3. With private bath, for one person in double room, \$3.50; for two persons in double room, \$5.

EUROPEAN PLAN.

On the Boardwalk.

YOUNG'S HOTEL. Without private bath, for one person in single room, \$1.50; in double room, \$2; for two persons in double room, \$3; in extra large room, \$4. With private bath, for one person in single room, \$4; in double room, \$6; for two persons in double room, \$7; in extra large room, \$10. Also on American plan as above.

St. James Place.

SEA CREST. Without private bath, for one person in single room, \$1; in double room \$1; for two persons in double room \$2; in extra large room, \$2. Also on American plan, as above.

These hotel rates were furnished by the Atlantic City Bureau of Publicity, who are co-operating in arranging for the convention. The hotels on this list are contributors towards the expense of securing the Million Dollar Pier without expense to the Association and it is suggested that, as far as possible, members patronize these hotels. In a very few cases the rates given seem not quite clear, and it is suggested when writing for accommodations to have the hotels confirm the rates here given.

There will be excursion tickets and reduced rates of railroad fares on account of the convention, particulars of which will be given later.

CHICAGO THE CITY.

The annual convention of the National Implement and Vehicle Association will be held in Chicago, October 17, 18, 19 and 20. The Congress hotel will be association headquarters and the convention sessions will be held in the hotel. Extending the convention over four days is an innovation. Heretofore only three day meetings have been held. Frequently it has been necessary to adjourn before action had been taken on some of the important matters coming before the convention. It is believed the four days will afford ample time for proper attention to all features of the association work.

PAINTED AS WELL AS IN THE WHITE.

The August Schubert Wagon Co., of Oneida, N. Y., purchased at the receiver's sale the Dapson & Wolf stock and painting outfit, and in addition to their regular manufacturing business of gears and work in the white, will now carry on a painting department as formerly done by the Dapson & Wolf Company. This new branch now added to their business will be appreciated by friends in the trade, as they now can buy finished work as well as in the white.

THE GOODRICH ROAD MARKERS.

Not since the appearance of the automobile has a manufacturer connected with the industry undertaken such an interesting public service enterprise as the national road marking work of the B. F. Goodrich Company, of Akron Ohio.

The Goodrich road marking work was started in April of last year. The company has placed a sign post every three miles along the main highway routes from Cleveland to Buffalo, then to Albany and New York City; over to Philadelphia and Atlantic City, and back to New York by way of Lakewood.

The middle of March this year a van and crew began the work of encircling Long Island with the road markers. After the work in that section, the tourists' route is taken up from New York City through Connecticut to Boston and then around the complete circuit of New England following the path of "Ideal Tour." This last means the delightful variety of all the ocean resorts along the Atlantic coast clear up to Portland, Maine, then inland to Poland Springs, across to the White Mountains and down to Manchester, New Hampshire, to the Berkshires—Lenox and Stockbridge—celebrated particularly as autumn rendezvous for the tourists, and back to New York. This scope of the "Ideal Tour" includes more than 750 miles of the most picturesque territory in the United States.

While this work is progressing, another van and its crew have begun to mark the other side of the continent.

This coast road marking means, all told, about 1,500 road markers to be put up within the next few months for the convenience of the tourist. It will mean that the resorts of the coast and its



Goodrich Road Markers' Truck.

scenic delights will be more accessible to the motorist than they have ever been before. This work is identical in spirit with the public undertakings in the West to improve highways and build good roads. It will bring town and country nearer together. It is an enterprise for the public good that is unique.

The post is a heavy timber, 4x4 inches, and about 12 feet high. This piece is thorough creosoted to make it weather-proof. On top is the sign plate. This is a round metal disc, 24 inches in diameter, enclosed by a painted border with the lettering "Goodrich Tires." Through the center of this round piece are drawn two arrow blades with spaces for the names of three towns, the next nearest town, the next largest town, and the ultimate destination. Opposite each name are the distances carefully reckoned to the fraction of a mile. Projecting out from the disk and pointing in the remaining directions are two other blades. All the blades are brightly painted in contrasting colors, so that the information printed thereon is easily read by the traveler as he sits in his conveyance.

Perhaps the most careful preparation and foresight for the comfort of the tourist is the provision of symbols to indicate ways of meeting the emergencies of the road. Opposite the name of a town is a symbol indicating the kind of relief there to be obtained. Lower down on the post is a plate bearing a copy of all symbols, together with an explanation of each one.

The sign is placed in a hole 3½ feet deep, and rested on a large stone so as to prevent wood decay by contact with the earth. After the post is set up the hole is filled with earth and rocks

up to a few inches of the surface and thoroughly tamped. Thus the post is perfectly firm, weather-proof and permanently in service.

The problems involved in the construction of these posts have been most varied. The design of the metal piece has been the subject of experiment to determine the proper shape and area of that there will not be straining resistance to the wind. The matter of metal rust has been avoided not only by the application of liquid preparations to the disc surface, but in the composition of the metal itself by a special process. The working road equipment consists of a supply of posts, metal pieces and the digging tools. These are carried in the motor vans working over various parts of the country. Two or three men work with each van, and live on board. They can put in about nine signs a day.

The location of the signs has been worked out for every cross-road and town; and this information was gathered before a single post was set up. A series of topographical maps from the United States Geological survey has been used.

There is another fund of information, which will be put at the disposal of the user of the highway, and which will have the greatest significance, particularly to the Good Roads cause.

The data relates to the condition of highways over the whole territory posted. For each post put up, a card is made out. Each post is numbered, the date of placing is written down, and the direction it faces and its position on the highway recorded. Particular effort is being made to gather accurate statements of the conditions of roads, their care or neglect, and the method of construction.

Already the printing of about ten route books for the eastern work has been planned—one for every section of territory covered by the road markers. There will be a series of books for the Middle West and a series for the Coast.

Each book contains "Tire Pointers," such as "How to Repair a Simple Puncture," "How to Repair a Small Hole or Cut in the Casing," and a "Weight and Inflation Schedule." There is also a very complete chart of the Motor Vehicle Laws in all the states.

From data contained on the cards described above, a summary has been compiled of road conditions, of the location of repair garages, gasoline stations, the hotel accommodations, and the towns where Goodrich tires are kept regularly in stock.

And finally there is in this book a road map of the route along which the road markers have been placed. The location of the markers is distinctly shown, the "main route" is distinguished from "intersecting roads," the "steep up-grade" is pointed out also the railroads and the electric railroads.

City maps are added to guide the tourist through the large municipality. The same is true in the case of small towns where the streets or roads are at all confusing.

These books will be ready for distribution in the spring when the touring season opens.

EDWARDS BECOMES SUPERVISING ENGINEER.

H. K. Edwards, chief engineer of the Dayton Motor Car Co., who has just returned from a visit to Europe, has been appointed supervising engineer of the United States Motor Co. and will have to do not only with the Stoddard-Dayton product, but with the product of all the factories included in the United States company's organization. Edwards, whose appointment took effect July 1, will make his headquarters in New York.

INTERESTING AND VERY COURTEOUS.

Fornede Danske Motoreiere (Association of Danish Motor Owners), through Mr. Victor Hansen, Copenhagen, has sent *The Hub* its map publication of the routes in Denmark, in colors.

We appreciate the kindness, and hope readers who may propose touring the Continent will not overlook so interesting a land as the home of the Dane.

MOTOR TRUCK ADVERTISING.

The sales department of any wide-awake institution is always on the alert for evidences of successful and profitable advertising. The W. H. McIntyre Co., Auburn, Ind., seems to have found its plans meeting with undoubted splendid results.

Mr. W. H. McIntyre, president of the W. H. McIntyre Co., in evolving his plans for exploiting his commercial truck, gave the subject much thought and considered ways and means long, hard,

early and often before he launched the campaign which has been exciting the wonder of the trade and it was to satisfy the manufacturers who have been watching the McIntyre campaign of advertising so carefully that The Hub addressed a communication to Mr. W. H. McIntyre, making inquiry as to what success had met with his plans. We publish his reply herewith:

"Editor The Hub.—

"When I began to lay my plans for advertising the McIntyre commercial truck, I decided that my company was not so large or successful that I could afford the luxury of any foolish advertising, and that I was in this business for getting something more out of it than the excitement of seeing my name in the paper, and that I was not interested in getting a thrill from seeing several pages of my advertising in some magazine. I figured that I was making a commercial power wagon, that it was a commercial proposition and must be treated in a business-like way. I came to the conclusion that the butcher and baker and maybe the candlestick-maker ought to have a motor wagon, that many were thinking about it, some had made up their minds and others would

local express man and those who maintain delivery or hauling departments. My plan, therefore, was to advertise in the home or local papers to interest these people and to make these announcements over the name of the local dealer. This is a plan that I have been following, and that we have driven many customers to the doors of local agents that have become associated with us and have received thousands of inquiries is plainly shown by the volume of business that has accrued in this selling campaign and the force of stenographers I am keeping busy answering the mail.

"The advertisements that we have placed in these home papers have been the best that my sales department could prepare. I spared no expense in having copy prepared that would be effective. I allowed the agent to pick out the papers, and the results have exceeded my most sanguine expectations. Newspaper advertising is not all of the campaign. I have judiciously distributed everything in the way of literature and printed matter that would help the agent. Having once placed a wagon in the locality sales were made more easily and this is what has helped more than anything else to spell success.

"Perhaps your readers would be interested in looking over some of the ads which we inserted in the local papers with the agent's name inserted, and I am sending you some of them. I believe you will agree with me that it is good stuff. Trusting that this information is about what you wanted, I beg to remain

"Very truly yours, W. H. MCINTYRE."

Herewith we show one of the single column electrotypes which are used in the local paper advertisements and it certainly is good "stuff." It is convincing and o't to bring the customer right up to the agent's door as the McIntyre Co. says in its advertisement.

MITCHELL-LEWIS CHANGES.

Several changes have been made in the staff of managers of the wagon department of the Mitchell-Lewis Motor Company, of Racine, Wis. John Dwight, a well known young business man of Racine, has been appointed factory manager, and Samuel R. Armstrong has been made superintendent. Mr. Armstrong has been connected with the company for a period of forty-four years, serving under Henry Mitchell, founder of the business, and later under Henry G. Mitchell, superintendent and vice-president, who recently passed away. H. P. Swenson, who also has been with the company for forty-four years, will continue in his same position as superintendent of the machine department. Charles Swenson, a nephew, connected with the company for twenty-two years, has been made assistant superintendent.

GOOD SHOWING.

A schedule of the assets and liabilities of the Columbia Carriage Company, Hamilton, Ohio, has been submitted to the creditors, showing the concern in good condition. The quick assets are \$240,192.08; active liabilities, \$222,141.28, leaving the excess of active assets, \$18,050.08. The fixed assets, including the equipment, less the total active liabilities, show the net assets over the liabilities, exclusive of the capital, to be \$236,929.26. It is believed the receivership will shortly be removed.

HEAR IT BLOW.

The largest whistle in Evansville, Ind., has been installed by the Hercules Buggy Company. It is a 12-inch three-bell strain gong whistle and has been put in position over the power plant of the factory.

GREAT WORK.

Sales totalling nearly \$750,000 were made during the year by the Stoughton (Wis.) Wagon Company, an increase of about 20 per cent over last year, according to Treasurer M. M. J. Veal.



Price, \$1,350
Guaranteed for One Year

Opportunity

Don't wait for it—make it.
Be one of the first in your line of business to change from the "old-style" delivery service to the

McIntyre

Commercial Power Wagon

Let us convince you by figures and actual demonstration the saving you can effect by installing this new and up-to-date automobile service. We will be glad to demonstrate the adaptability of this—"the world's greatest power wagon" to your needs.

McIntyre Heavy Duty Motor

Bore 5½—Stroke 4¾. The Owner, not the driver controls the speed. Positive automatic governor, absolutely preventing overspeeding, the source of 90 per cent of all motor truck troubles. Built for hard service.

Specifications Model No. 14

Capacity—2,000 pounds.
Wheel Base—119 inches.
Tires—Solid rubber, 2½ in.
Horse Power—24.
Cooling—Water Cooled.
Radiator—Vertical tube type.
Speed—2 speeds forward, 1 reverse; 4 to 12 miles an hour.
Mileage Capacity per Gallon—12 to 15 miles.
Ignition—Dual system magneto and dry cells.
Equipment—3 Oil lamps, horn, tools and jack.
Net Weight—2,200 pounds.

Dealer's Name

"There's a place in your business for us"

if the matter was placed before them in a clear and concise way (with facts showing the economy, convenience and modern, up-to-date side of the proposition.

"In order to interest the one who is in the market for a commercial car and to do it effectively would be to inaugurate a combined selling campaign addressed to the prospective user of delivery wagons and trucks on one hand, and the vehicle dealer, wagon maker or garage proprietor on the other. There are now probably ten thousand of these dealers and makers in cities and towns where commercial vehicles can be readily sold. These dealers or makers are in close touch with the store keepers, the

Trade News From Near and Far

BUSINESS CHANGES

Jason Thompson has purchased the vehicle business of Geo. Roth, in Milan, Mo.

Con Schurz has succeeded to the vehicle business of Stopfer & Schurz, in Ethan, S. D.

Bert Kissell has purchased the stock of vehicles, etc., of J. E. Hobbs, in Eustis, Neb.

Coleman Foley has purchased the stock of vehicles, etc., of J. W. Klemme, in Alma, Ia.

The hardware firm of Marr & Hause, Ainsworth, Ia., will soon add a line of buggies, etc.

F Horden has purchased the stock of vehicles, etc., of A. Schwank, in Madison, Neb.

S. K. Brown has purchased the vehicle business of Spencer Cameron, in Stockville, Neb.

V. Holderby has purchased the stock of buggies, etc., of F. L. Florin, in Davenport, Wash.

C. F. Smith has disposed of his stock of vehicles, etc., in Bernard, Ia., to B. G. Dorothy.

Jos. Schaefer has purchased the vehicle business of John Traun, in Richmond, Minn.

O. L. Wright has disposed of his vehicle business in Stromsburg, Neb., to W. C. Wright.

W. A. Crowe has disposed of his implement business in Minneota, Minn., to C. K. Melby.

J. H. Bartell has sold out his stock of buggies, etc., in Harrison, N. B., to L. A. Paullins.

M. T. Daniels & Son have purchased the stock of vehicles, etc., of Wrenn & Clas, in Udell, Ia.

C. L. Carlson has disposed of his stock of vehicles, etc., in Axtelee, Neb., to Mann & Lozier.

Wolton & Montford, hardware dealers of Blaine, Wash., are about to add a line of buggies.

A. Tompkins has disposed of his vehicle and hardware business in Inman, Neb., to Will Riley.

E. L. West has sold his vehicle and implement business to Clyde Miller, in Sharpsburg, Ia.

Crellin Bros. have sold out their stock of buggies, etc., in Pender, Neb., to Peter Henningsen.

E. T. Johnson & Co. have disposed of their vehicle business in Olustee, Okla., to E. G. Walcott.

Watkins & McDonald have purchased the stock of vehicles, etc., of John Mundt, in Cushing, Ia.

E. E. Dill has purchased the stock of vehicles and hardware of Dieter & Dankey, in Madison, Neb.

C. C. May has purchased the stock of vehicles, etc., of J. S. Thomas & Son, in Lexington, Neb.

Anderson & Peters have purchased the stock of vehicles, etc., of Aug. Engdahl, in Wausa, Neb.

George D. Hughes has purchased the stock of buggies, etc., of A. A. Colgrove, in Faulkton, S. D.

O'Neill Bros. have purchased the stock of vehicles, etc., of O. A. Hutchings, in Manhattan, Kas.

A. A. Thompson has sold out his stock of vehicles, etc., in Casey, Ia., to Wm. & F. R. Valentine.

Ernest Dial has disposed of his stock of buggies, etc., in Cawker City, Kas., to Charles Alderson.

Emery Conwell has purchased the stock of vehicles, etc., of Bricker & Thompson, in Oneida, Kas.

A deal has been made whereby R. A. Seibert & Co., Mt. Carmel, Ill., became the owners of the T. H. Kingsbury stock of im-

plements, consisting of cultivators, plows, hay rakes and farm wagons.

T. C. Martin has purchased the hardware and vehicle stock of A. B. Baker & Co., in Pullman, Wash.

Bryant Bros. have purchased the stock of vehicles, etc., of Ritter & Shoemaker, in Haviland, Kas.

P. J. Fitschen has purchased the implement and vehicle business of Otto Schmidt, in Danube, Minn.

G. W. Fagley has purchased the stock of vehicles, etc., of the Towner Mercantile Co., in Towner, Col.

Bartlett Bros., manufacturers of carriages, at Brodhead, Wis., have sold out to Paul and Edwin Wilmy.

Wm. Dreyer has disposed of his implement and vehicle business in Arlington, Ia., to Ackerman & Co.

Waldron and Slaughter have purchased the stock of vehicles, etc., of McCoy & McCoy, in Howe, Texas.

Wm. Triggs has purchased the stock of vehicles and implements of John C. Shaffer, in Summit, S. D.

Emil Felenzer has disposed of his implement and vehicle business in Bozeman, Mont., to Frank Heaney.

W. M. Bevers, formerly of Zumbrota, has engaged in the vehicle and implement business in Goodhue, Minn.

E. L. Burruss contemplates the establishment of a plant in Emporia, Va., for the manufacture of buggies.

J. L. Scifers has been succeeded in the implement business in Arriba, Colo., by Scifers, Stambaugh & Lilly.

The master commissioner sold the plant of the Melbourne Buggy Company, Newport, O., to M. C. McNamara.

Brown & Pooch have purchased the vehicle and implement business of Gerth & Johnson, in Lamberton, Minn.

Wolgast & Wilson have disposed of their hardware business in Stockville, Neb., but continue to handle vehicles.

The Farmers Hardware & Implement Co. has succeeded to the stock of vehicles, etc., of Olson & Cook, in Willow Lake, S. D.

Franson Bros. have purchased the vehicle and implement business of R. H. McEnany, in Ross, N. D., and will handle vehicles.

Elmers & Wood have purchased the stock of vehicles, etc., of W. C. Hill, in Whitebird, Ida., and John Rice will be the manager.

The building now occupied by Myers & Van Duyn, Springfield, Ill., carriage makers, will be vacated and work started toward the remodeling of the building into store rooms.

Dad Boyle, owner of the Dad Boyle Wagon Manufacturing concern of Amarillo, Tex., has announced that he has decided to move his plant from that place and establish himself in Houston.

G. W. Bainey, Macomb, Ill., has finished moving into the building formerly occupied by the Sheet Metal Works. Mr. Rainey will fix it up in approved style for buggies and harness.

NEW FIRMS AND INCORPORATIONS

J. F. Gunsaulus is engaging in the vehicle business in Blunt, S. D.

J. E. Devore has opened a new stock of vehicles, etc., in Adna, Wash.

E. Little has just opened a new stock of buggies, etc., in Mexico, Mo.

Pelze & Son have opened a new stock of buggies, etc., in Barney, N. D.

J. W. Lee is about to engage in the vehicle business in Bridgeport, Neb.

Long-Winston Company, Oxford, N. C., capital \$50,000, to

handle buggies, wagons, harness, farm implements, W. J. Long, president, Walter Crews, vice-president.

A. D. Young has opened a new stock of vehicles, etc., in Watoa, Okla.

Walter Frye has opened a new stock of vehicles, etc., in Mun-sing, Mich.

Nessa & Valen have engaged in the vehicle business in Garden City, Ia.

Shockman Bros. are just engaging in the vehicle business in Berlin, N. D.

Edwin Berre is about to put in a line of vehicles, etc., in Cottonwood, Minn.

Barton & Thornton have opened a new stock of vehicles, etc., in Altoona, Ia.

August Hendrix has just opened a stock of vehicles, etc., in Hawarden, Iowa.

Mitchell & Fruchy have engaged in the buggy business in Beaverton, Mich.

H. E. Day is engaging in the vehicle and implement business in Amboy, Minn.

Harvey & Regan are erecting a three-story buggy factory in Oakesdale, Wash.

Wingate & McGuin have opened a new stock of buggies, etc., in Independence, Kas.

Day Bros. have just engaged in the vehicle and implement business in Rotan, Tex.

Frank Taylor has opened a new stock of buggies and hardware in Council Grove, Kas.

F. W. Ross is about to engage in the vehicle and implement business in Sterling, Kas.

J. C. Kumpel has engaged in the vehicle and implement business in Hingham, Minn.

Smith & Peebles have engaged in the vehicle and hardware business in Emmet, Neb.

F. L. Hodgson has put in a new line of automobiles, carriages, etc., in Stewartville, Minn.

Charles and Ole Alpin are about to open a new stock of buggies, etc., in Timmer, N. D.

Kiefer & Torner have opened a new stock of vehicles and implements in Middletown, Ill.

C. G. Wadleigh has engaged in the vehicle and implement business in Alexandria, Minn.

The Texas Buggy Co. has been incorporated in Sherman, Tex., with a capital stock of \$10,000.

The Hines Buggy Co. has been incorporated in Boykins, Va., with a capital stock of \$25,000.

J. D. Howard & Co. have organized in Byron, Oklahoma, to do a vehicle and implement business.

The J. R. Raney Co. has been incorporated in Santa Ana, Tex., and will handle a line of buggies.

The Blaney Hub & Buggy Co. has been organized in Blaney, S. C., with W. H. Tiller as president.

The Crescent Hill Auto Supply Co., has been incorporated in Louisville, Ky., by John M. Banta and others.

The Laughlin & Kelly Co., has been incorporated in Antigo, Wis., with a capital of \$25,000, to handle vehicles.

The Carter Dump Wagon & Mfg. Co. has engaged in business in Holland, Mich., with a capital stock of \$50,000.

The J. Harold Ferguson Co. has been incorporated in Huntington, W. Va., with a capital of \$25,000 to handle buggies.

Davenport Wagon Company, Moline, Ill., capital \$300,000; agricultural implements, etc., incorporated by William Butterworth, W. L. Velie.

The Fountain Hardware & Implement Co. has been incorporated in Fountain, Colo., with a capital of \$10,000, and will have a harness department.

H. Smith's Son, Manteno, Ill., autos, vehicles, etc., has been incorporated with a capital of \$20,000. Incorporators, S. J. Smith, Jos. O. Smith, R. E. Smith.

NEW AUTOMOBILE INCORPORATIONS.

The Noiseless Truck and Wheel Company, Cedartown, Ga., will soon commence operations.

Leeper Automobile Company, St. Louis, Mo., capital \$2,000, to deal in automobiles, etc., incorporated by O. W. Schmidt, S. H. Leeper.

National Motor Device Co., Chicago, Ill., to manufacture automobiles, capital \$60,000; incorporated by C. O. Garmire, J. H. Heglund.

Herman Motor Truck Co., Chicago Ill., capital \$30,000, incorporated by P. W. Herman, G. P. Williams, to manufacture automobiles, etc.

Eastern Motor Sales Co., to manufacture and deal in automobiles, capital \$500,000, incorporated by C. P. Boland, C. V. Collins, Troy, N. Y.

American Starter & Carburetor Mfg. Co., Chicago, Ill., capital \$25,000, to manufacture automobiles, etc., incorporated by J. B. Dilbelka, F. Breska.

Sireno Co., New York, to manufacture and deal in automobile accessories, capital \$50,000, incorporated by Stillman H. Story, 46 Crown street, Brooklyn.

The Pneumatic Suspension Wheel Co., capital \$250,000, to manufacture and repair motor vehicles, etc., incorporated by C. W. Miller, H. H. Melville.

The Stanley Differential Hub Co., Logansport, Ind., capital \$60,000; to manufacture automobile parts, directors, E. D. Morgan, Z. Taylor, Clark Taylor.

United States Wood Working Co., Buffalo, N. Y., to manufacture automobile and carriage seats, etc., capital \$100,000, incorporated by H. Lewis, A. Panimo.

R. W. Snow Co., Syracuse, N. Y., to manufacture and sell automobile parts, and conduct machine shops, capital \$25,000, incorporated by J. E. Snow, L. A. Chapman.

Lincoln Motor Car Works, of Chicago, with a capital of \$50,000 will begin manufacturing and dealing in automobiles, engines and accessories; Sidney Adler, R. Boerman, and Charles Lederer are the promoters of the new concern.

The Ideal Auto Top & Trimming Company, Youngstown, O., will manufacture all kinds of automobile tops and will make a specialty of general repairing. The promoters are J. W. Pulford, of Cleveland, and F. J. Paddon, of Youngstown.

Senator Motor Car Company, of Pittsburg, Pa. to manufacture and sell automobiles and other motor vehicles, capital stock \$200,000. The incorporators are Percy T. Cobun, of Wilkinsburg, Penn.; Augustus Schmidt, John Vetter, George C. Campbell, Howard A. Young, of Pittsburg.

IMPROVEMENTS—EXTENSIONS.

A. W. Palin is erecting an addition to his carriage factory in Thomasville, Ga.

Hayes Wheel Co., Jackson, Mich., has increased its capital from \$30,000 to \$100,000.

Ohio Motor Car Co., Carthage, Ohio, has increased its capital from \$10,000 to \$450,000.

The Hupp Corporation, Detroit, Mich., increased its capital from \$700,000 to \$800,000.

The Dorris Motor Car Co., is about to build a \$250,000 addition to its plant in St. Louis, Mo.

Grabowsky Power Wagon Co., Detroit, Mich., has increased its capital from \$50,000 to \$1,000,000.

The Commerce Motor Car Co., of Detroit, Mich., has increased its capital stock from \$10,000 to \$25,000.

A new brick store building has been completed and occupied at Garland, Tex., by M. D. Williams, dealer in vehicles.

The Parlin & Orendorff Plow Company, of Canton, Ill., has completed its new \$35,000 warehouse at Spokane, Wash.

The Ford Motor Co., Detroit, Mich., is preparing plans for

additional buildings, the main one to be 865 feet long by 75 feet in width and stand to the rear of the main building along the Woodward avenue front of the plant. About \$600,000 will be expended on the new buildings.

The Ogburn Buggy Co., has perfected plans for the rebuilding of its plant in Dublin, Ga., which was recently burned.

The building being erected by Mr. I. Block for the Williams Wagon Works, Macon, Ga., will soon be completed and ready for occupancy.

The Michigan Crank Shaft Co., of Muskegon, Mich., has increased its capital from \$20,000 to \$50,000 to take care of its increasing business.

The Mitchell-Lewis Motor Company, Racine, Wis., has commenced the erection of a large branch house at Dallas, Texas. The new branch house will be in charge of Frank Rowan.

Announcement has been made of the purchase by Deere & Co., of Moline, Ill., of the Davenport Wagon Company's plant at Davenport, Iowa. Deere & Co. will also buy the Syracuse chilled plow plant of Syracuse, N. Y.

The Alden Sampson Manufacturing Co., Detroit, Mich., will build a new addition to the present plant. This company at present lays claim to the longest motor truck factory in the world, a structure of 1,020 feet in length.

The Lozier Motor Company, Detroit, Mich., has decided to increase its capitalization another \$1,000,000. The new capital will be used for the enlargement of manufacturing facilities. The Lozier truck will be out in the fall.

Two large additions to the plant of the Thomas B. Jeffrey Company, Barry, Ill., manufacturers of Rambler Motor Cars, at Kenosha, Wis., will be made immediately. A new addition to the drop forge shop is now in course of construction.

The Streator Motor Car Company, of Streator, Ill., has increased its paid-in capital stock from \$300,000 to \$500,000. With the increase there has been some change in the personnel of the officers of the company, which is now as follows: John C. Barlow, president; Paul R. Chubbuck, vice-president; A. L. Goetzman, treasurer; Robert Van Arsdale, secretary. Both Mr. Goetzman and Mr. Van Arsdale are Chicago men; the former for several years has been secretary of the Millers' National Federation, and will take an active interest in the business. There will be no change in the working force of the organization and no change in policy.

BUSINESS TROUBLES.

The jury in the case of the Brown Carriage Company vs. H. A. Davidson, suit for payment of notes, rendered a verdict in favor of the plaintiff in the sum of \$345.83.

Frantz Body Mfg. Co., Akron, O., has assigned and J. R. Vaughn and George Maag, both of Akron, have been made receivers. The affairs of the company look good for an early favorable settlement.

A voluntary petition in bankruptcy has been filed by the Michigan Auto Trimming Co., of Detroit, Mich., of which B. F. Glines and O. J. Anderson are president and secretary, respectively. The liabilities of the company are given at \$11,940.

An involuntary petition in bankruptcy was filed by three creditors against Ernst Stolp & Co., dealers in agricultural implements. The creditors are W. H. Dick, with a claim of \$200; the Lull Carriage Co., with a \$5,500 claim, and James J. Palmer, Milwaukee, with a claim of \$250.

At a conference between the stockholders and the creditors of the Columbia Carriage Works, Hamilton, O., which went into the hands of the receivers, Wright and Curley, the managers of the company, presented a report so favorable that it is predicted that the Columbia Carriage Works will be lifted out of the hands of the receivers.

The Deinzer & Stephen Spoke and Hub Factory, Hamilton, O., capitalized at \$25,000, with all stock paid in, filed a deed of as-

signment and E. G. Ruder, cashier of the First National Bank, was appointed receiver. The firm asked the court to administer the property as a trust fund for the benefit of its creditors. The partners, George Deinzer and W. H. Stephen, say their debts are about \$38,000.

Under the order of sale made by the court on March 15, 1911, of the Abbott-Downing Co., it was ordered that receiver sell his interest in the property before June 15, 1911, and he was authorized to join with those representing the second mortgage, who expected to be in a position to convey title to real estate before that date. Those representing the second mortgage have not been able to complete their proceedings to join with the receiver in a sale, and the court has extended the time to August 15, 1911.

FIRES

Fire destroyed the Linker hub factory at Leslie, Ark. Loss not given.

Fire destroyed the stock of vehicles, etc., of D. A. Scranton, in Syracuse, Kas.

The vehicle establishment of F. B. Taylor, in Carlisle, Ky., has been destroyed by fire.

Theodore Egbert, a vehicle dealer in Whittemore, Ia., has sustained a fire loss of \$14,000.

F. C. Christian, dealer in harness and vehicles at Whitewright, Tex., sustained a fire loss of \$8,000.

The stock of vehicles, etc., of Louis Fitcher, Madison Lake, Minn., has been destroyed by fire.

The stock of vehicles and implements of Miller & Howell, in Corydon, Ia., has been damaged by fire to the extent of \$5,000.

The stock of vehicles, etc., of J. J. Duroe & Son, Jeffers, Minn., has been burned. Loss about \$20,000.

MICHIGAN SALES AGENTS.

The Michigan Distributing Company, successor to the business of the Manufacturers' Distributing Company, of Lansing, Mich., has taken the exclusive selling agency for Michigan of several well known lines of goods. Among these is the line of implements and vehicles manufactured by the Racine-Sattley Company, Racine, Wis., and Springfield, Ill., and the Bain Wagon Company, Kenosha, Wis. The company also handles the goods of the Peru Plow & Wheel Company, Peru, Ill., the Parry Manufacturing Company, Indianapolis, Ind., and the Caldwell Manufacturing Company, Columbus, Ind.

WAGON FACTORY SOON TO TURN WHEELS.

At a meeting of the directors of the Board of Trade of Fort Worth, Tex., and the directors of the wagon factory arrangements were made for the settlement of the bonus question, which has been hanging on for a long time. There are some details which will not be given to the public just at this time, but the arrangements were so satisfactory that the regular work of the factory will not be pushed. The boilers are already fired up and some work is being done.

JOHN HENNEY, JR., WITH STAVER COMPANY.

The Staver Carriage Company, Chicago, Ill., has secured the services of John Henney, Jr., as superintendent, succeeding J. McCauley, deceased. Mr. Henney is recognized as one of the strong men in the carriage industry, and the company feels that his experience as a carriage builder will contribute to the further up-building of the company's business.

NICE POSTER.

Rattermann & Luth, the Cincinnati builders, have favored us with a copy of the "hanger" they are sending to the dealers in vehicles. It is effective as a reminder.

DATES OF DEALERS' CONVENTIONS.

The following convention dates have been selected by the associations named. The dates of other conventions will be published as soon as reported:

Illinois Retail Implement and Vehicle Dealers' Association, at Peoria, October 10, 11 and 12.

Tri-State Vehicle and Implement Dealers' Association at Cincinnati, October 24, 25 and 26.

Michigan Retail Implement and Vehicle Dealers' Association, at Lansing, November 7, 8 and 9.

Mid-West Implement and Vehicle Dealers' Association, at Omaha, November 15, 16 and 17.

Oklahoma Retail Hardware and Implement Dealers' Association, at Oklahoma City, December 5, 6 and 7.

Iowa Implement Dealers' Association, at Des Moines, December 5, 6, 7 and 8.

Retail Implement Dealers' Association of South Dakota, Southwestern Minnesota and Northwestern Iowa, at Sioux Falls, S. D., December 5, 6 and 7.

Wisconsin Retail Implement and Vehicle Dealers' Association, at Milwaukee, December 12, 13 and 14.

Minnesota Retail Implement Dealers' Association, at Minneapolis, January 10, 11 and 12, 1912.

Western Retail Implement and Vehicle Dealers' Association, at Kansas City, January 16, 17 and 18, 1912.

Pacific Northwest Hardware and Implement Association, at Spokane, Wash., January 17, 18 and 19, 1912.

Oregon Retail Hardware and Implement Dealers' Association, at Portland, January 23, 24, 25 and 26, 1912.

Mississippi Valley Retail Implement and Vehicle Dealers' Association, at St. Louis, Mo., January, 1912.

Texas Hardware and Implement Association, at Dallas, February 13, 14 and 15, 1912.

TENT SHOW.

Beginning October 2 and ending October 7, St. Louis is to try out a novel idea in automobile shows. It is to be an outdoor show under great circus tentage, held in one of the enclosed parks of the city where there will be more than ample room for every applicant for space.

The show is to be held by the St. Louis Automobile Manufacturers' and Dealers' Association, and the dates set are St. Louis' gala week, known over the entire country as Veiled Prophet's Week. It is practically assured that all of the leading dealers and manufacturers in St. Louis will exhibit at the show and elaborate preparations have already begun to make it something bigger than has ever been attempted in St. Louis in any line of trade and far eclipsing any previously held automobile show.

The show will be in two divisions, one for pleasure vehicles, gas and electric, the other for delivery wagons and trucks, and it is possible that a still further division may be made for accessories, giving each section practically a separate show for one admission price.

At a meeting of the board of directors held Thursday, May 4, this was finally decided and a show committee was appointed, consisting of H. B. Krenning, of the Dorris Motor Car Co., John H. Phillips of the Phillips Automobile Co., Samuel Breadon, of the Western Automobile Co.; D. R. Brownback, of the Stearns Automobile Co., W. C. Anderson, of the Ford branch house, and the president, F. R. Tate, of the United Motors St. Louis Co.

BLEW 'EM OFF.

T. M. Sechler, president of the D. M. Sechler Carriage and Implement Company, Moline, Ill., was host at a dinner at the Manufacturers' Hotel. It was an annual affair for traveling salesmen, the office force and heads of departments of the plant.

OBITUARY

W. F. Stewart, who died in Flint, Mich., May 20, is thus spoken of by his associates in the Manufacturers' Association of Flint: "Although identified more particularly with the vehicle interests, still the entire community of Flint feels a loss in the death of W. F. Stewart, of which we now advise you. His widest acquaintance was in business channels and among his warmest friends were all those who had business relations with him, for his estimate of business ethics and integrity was of the highest type. His steady progress from boyhood, as a farmer boy, through ever-progressive experience up to the forefront in the manufacture of vehicle woodwork, leaves behind a record of honorable achievements, a splendid legacy to posterity and example to successors. We who knew him intimately grieve at the passing of a genial friend, a true, loyal and generous friend, a man of warm sympathy, beautiful character and highest integrity."

Henry George Mitchell, vice-president of the Mitchell-Lewis Motor Company, of Racine, Wis., and a director in other large manufacturing corporations, died suddenly May 31 from heart trouble. He was in his usual good health up to late in the evening, and in uncommonly high spirits over his success in winning the sweepstakes event at a golf tournament at the Country Club in the afternoon. Later he was suddenly stricken and died. Mr. Mitchell was born in Kenosha, March 26, 1848, and was the son of the late Henry Mitchell, founder of the Mitchell Wagon Works. For many years he was superintendent and vice-president of the old Mitchell-Lewis Wagon Company and when the new Mitchell-Lewis Motor Company was organized he was elected first vice-president. He was a director of the Mitchell-Lewis Staver Company of Portland, Ore., a director in the Great Northern Implement Company, of Minneapolis, etc. Mr. Mitchell is survived by a wife, one daughter and three sisters and two brothers.

James McCauley, superintendent of the Staver Carriage Company, died June 14, aged fifty-two years, after an illness of nearly a year. He was in the company's employ for thirty years, beginning in the forging department. He was a trained carriage builder of the old school, well known and highly regarded in the trade.

J. R. Knott died very suddenly at his home in Brashear, Mo., of heart disease. About three weeks previous the deceased purchased the implement and vehicle business of A. W. Rouner and moved his family from the farm near Gibbs to Brashear. He leaves a wife and eight children.

James Fitzgibbons, of the well known firm of Fitzgibbons Brothers, Monroe, Wis., manufacturers of carriages, died at his home, 319 East Russell street. He was fifty years of age and is survived by a wife and two children.

THE PEORIA FAIR.

With capital stock subscribed, site selected, applications for space already pouring in, the directors of the National Implement and Vehicle Show elected permanent officers, named committees and took up the actual work of staging what promises to be the greatest feature of the kind Peoria ever possessed and which will become a feature to attract manufacturers and users of implements from all over the United States. The following is the roster:

President—J. B. Bartholomew.

First Vice-President—Gerald B. Franks.

Second Vice-President—John W. McDowell.

Treasurer—Robert Herschel.

Secretary—Charles E. Wheeler.

Headquarters will be located in the Cole Building.

Recently Granted Vehicle Patents

- 970,596—Motor Car Truck. Martin Albrecht, Friedberg, assignor to Felton & Guillaume-Lahmeyer Werke Actien-Gesellschaft, Frankfurt-on-the-Main, Germany.
- 970,574—Sleigh Runner for Wheeled Vehicles. Leonard Boffel, Jackson, Mich.
- 970,579—Variable Speed Transmission Gearing. Bernard Borgman, Geneva, N. Y.
- 970,792—Transmission Gearing. Charles A. Carlson, Brooklyn, N. Y., assignor to Carlson Motor & Truck Co., Philadelphia, Pa.
- 970,793—Shaft Coupling. Charles A. Carlson, Brooklyn, N. Y., assignor to Carlson Motor & Truck Co., Philadelphia, Pa.
- 970,790—Transmission Gearing. Charles A. Carlson, Brooklyn, N. Y., A. E. Osborn, New York, and J. C. Angelino, Brooklyn, N. Y., assignors to Carlson Motor & Truck Co., Philadelphia, Pa.
- 970,467—Transmission gearing Mechanism. Robert W. Coffee, Richmond, Va., assignor to L. M. Kelzer, Baltimore, Md.
- 970,802—Draft Gear. John F. Courson, Pitcairn, Pa.
- 970,892—Automobile Fender. Yves M. Crechriou, Monterey, Cal.
- 970,893—Dumping Wagon. Frederick N. Cronholm, Naches, Wash.
- 970,995—Power Transmission Mechanism. Thomas C. Dill, Philadelphia, Pa.
- 970,476—Wheel. Walter L. Dodd, Westville, Ind.
- 970,911—Vehicle Wheel. Samuel M. Friedman, New York, N. Y.
- 970,486—Spring Wheel. George E. Friesen, North Yakima, Wash.
- 970,706—Transmission Gearing. Daniel H. Haywood, New York, N. Y., assignor by mesne assignments, to Carlson Motor & Truck Co., Philadelphia, Pa.
- 970,835—Spring Wheel. Anton Knelp, Maspeth, assignor of one-half to W. B. Beillon, Brooklyn, N. Y.
- 970,841—Vehicle Wheel Support. Phineas J. MaxConnell, assignor of one-half to J. T. Creahan, Cincinnati, Ohio.
- 970,535—Vehicle Tire. William D. McNaul, Toledo, Ohio.
- 970,646—Hub Fastener. Arvid E. Roxberg, Brainerd, Minn.
- 970,647—Shock Absorber. James H. Sager, assignor to James H. Sager Company, Rochester, N. Y.
- 970,569—Wheel. Kristian K. Strube, Trenton, N. J.
- 971,100—Cushioned Vehicle Wheel. Maynard H. Aldridge, Plattsburg, N. Y.
- 971,103—Band Brake. Benjamin B. Bachman, Philadelphia, assignor to the Autocar Company, Ardmore, Pa.
- 971,434—Vehicle Wheel. John H. Eaders, St. Joseph, Mo.
- 971,267—Wheel Tire. Samuel Grunewald, Van Wert, Ohio.
- 971,195—Tire-bolt Cutter and Nut Turner and Splitter. George Heller, Milwaukee, Wis.
- 971,507—Front Gear for Wagons. George Kautz, Sr., assignor to H. M. Kautz, Albany, N. Y.
- 971,384—Wheel for Vehicles. Carl Kindscherf, assignor to Continental Caoutchouc & Gutta Percha Company, Hanover, Germany.
- 971,463—Wheel. Richard D. Moon, San Angelo, Texas.
- 971,067—Spring Wheel. Frederick C. Oldham, Brooklyn, N. Y.
- 971,475—Spring Suspension Arrangement for Vehicles. Carl E. Renen, Oberhomburg, and W. Romeliser, Frankfurt-on-the-Main, Germany.
- 971,318—Vehicle Wheel Rim. Edwin C. Shaw, assignor, by mesne assignments, to The United Rim Co., Akron, Ohio.
- 971,334—Controlling Mechanism for Vehicles. John T. Whalen, Brooklyn, N. Y.
- 972,094—Thill Coupling. William A. Buchanan, Asheville, N. C., assignor to Ball Bearing Coupler Co.
- 972,080—Spare Wheel for Motor Cars and the like. Georges Huysmans, Brussels, Belgium.
- 970,828—Trotting Sulky. George W. Hubbard, Cockeysville, Md.
- 970,527—Vehicle Spring. Charles A. Meredith, St. Louis, Mo.
- 972,082—Farm Wagon Bracket. John Kaminski, Hilliards, Mich.
- 972,006—Axle Lubricator. James L. Masters, Little, Ind.
- 972,012—Draft Equalizer. Daniel W. McNatt, Ridge, Tex.
- 971,557—Resilient Wheel. Marian B. Pierson, assignor of one-half to H. Menly, Corpus Christi, Tex.
- 972,129—Tire Ventilating Device. Donald Rawstron, Chicago, Ill.
- 971,937—Automatic Brake. Clarence L. Taylor, assignor to The Morgan Engineering Co., Alliance, Ohio.
- 972,047—Controller for Motor Vehicles. Alexander Winton, Cleveland, Ohio.
- 972,046—Detachable and Knockdown Folding Seat for Automobile Tonneau. Alexander Winton and H. B. Anderson, assignors to The Winton Motor Carriage Co., Cleveland, Ohio.
- 972,138—Variable Speed Mechanism. George E. Witherell, E. R. Seward, Hartford, and G. L. Mason, Warehouse Point, assignors to the Hartford Machine Screw Co., Hartford, Conn.
- 972,672—Change Speed and Reversing Gearing. John D. Abbott, Eastbourne, England.
- 972,143—Transmission Gear. Frank B. Allen, Salt Lake City, Utah.
- 972,756—Resilient Tire. Malby G. C. Dodwell, Wellington, New Zealand.
- 972,606—Vehicle Wheel. Axel E. Ellis, assignor to Steel Cushion Tire Co., Boston, Mass.
- 972,764—Tire. Emmett H. Herndon, assignor of one-half to R. H. Whitner, Sanford, Fla.
- 972,191—Reach for Vehicle. Henry Higgin, assignor to the Higgin Manufacturing Co., Newport, Ky.
- 972,453—Motor Wheel. James N. Johnson and J. H. Johnson, Flomaton, Ala.
- 972,541—Detachable Wheel Rim. George E. Kipp, Niverville, N. Y.
- 972,547—Electrically Propelled Vehicle. Willy Kohler, Bremen, Germany.
- 972,393—Vehicle Seat. Charles B. Moore, Rochester, Ind.
- 972,658—Running Gear for Vehicles. James O. Smith, Daleville, assignor of one-half to J. L. Harbour, DeKalb, Miss.
- 972,274—Emergency Tire. Winfield S. Smith, Ossining, N. Y.
- 972,280—Spring Wheel. James Stallings, Fairmount, Ill.
- 972,283—Resilient Wheel. John J. Stone and J. A. Simpson, Beresford, S. D.
- 972,486—Wheel. Louis K. Thorspeck, South Haven, Mich.
- 972,734—Vehicle Wheel. George H. Thomas, assignor to Thomas Resilient Wheel Co., Elmira, N. Y.
- 972,587—Driving Gear Mechanism. Albert W. Wigglesworth, Chicago, Ill.
- 972,670—Running Gear for Dumping Wagons. Lorenzo H. Young, assignor of one-half to V. P. Hill, Hagerstown, Md.
- 973,251—Automobile. John B. Bartholomew, Peoria, Ill.
- 972,808—Automatic Wagon Brake. George W. Brewer, Add, Ky.
- 973,162—Tire Retaining Flange for Wheel Rims. Richard S. Bryant, Columbus, assignor, by mesne assignments, to The United Rim Co., Akron, Ohio.
- 973,035—Tire Setter. Edward Grenelle, assignor to the West Tire Setter Co., Rochester, N. Y.
- 973,436—Vehicle Wheel. Charles Humbert and J. C. Beugnot, Paris, France.
- 973,277—Dumping Wagon. Everett R. Jones and W. A. Yockey, Spokane, Wash.
- 973,278—Tire. Iva B. Kempshall, Boston, Mass.
- 973,054—Wheel. George H. Langton, Los Angeles, Cal.
- 973,055—Wagon-body Dumping Mechanism. Earl P. LeGore, Philadelphia, Pa.
- 973,366—Car Body Construction. William R. McKeen, Jr., assignor by mesne assignments, to McKeen Motor Car Co., Omaha, Neb.
- 973,217—Shock Absorber. James H. Sager, Rochester, N. Y.
- 972,930—Vehicle Wheel. June M. Selleck, Chicago, Ill.
- 972,941—Dump Wagon. Joseph Stifter, Pittsburg, Pa.
- 973,245—Resilient Tire. David A. York, Northgrove, Ind.
- 974,012—Adjustable Vehicle Brake Block Holder. Lawrence J. Badgley, Florissant, assignor of one-half to H. L. Redecker, Denver Col.
- 974,034—Vehicle Lantern. Fred E. Davis, Bessemer, Ala.
- 974,046—Metallic Tire. Albert J. Fortescue, Arncliffe, near Sydney, New South Wales, Australia.
- 973,769—Spring Wheel. Arthur J. Frogue, Kansas City, Mo., and M. A. Weber, LaCrosse, Wis.
- 973,781—Resilient Tire. Nels H. Hassel, Los Angeles, Cal.
- 973,516—Shock Absorber for Vehicles. William Kootz, Milwaukee, Wis.
- 973,517—Vehicle Frame. William Kootz, Milwaukee, Wis.
- 973,524—Wagon Tongue Support. Roy G. Lucas, Plover, Iowa.
- 973,531—Truck Construction. William R. McKeen, Jr., assignor, by mesne assignments, to McKeen Motor Car Co., Omaha, Neb.
- 973,706—Wind Shield. Leonard J. Sanker, Los Angeles, Cal.
- 973,569—Spring Vehicle Wheel. Henry W. Schmidt, Detroit, Mich.
- 973,578—End Gate Fastener. Benjamin F. Springer, McLean, Ill.
- 973,718—Buggy Bow Rest. John A. Stafford, Grady, Okla.
- 974,625—Driving and Steering Means. Andrew K. Baltesor, Wentzville, Mo.
- 974,347—Spring Wheel. Louis Blessing, Jackson, Mich.
- 974,547—Vehicle. Alexander M. Bollinger, Leechburg, Pa.
- 974,469—Wagon Box Brace. John H. Butt, Mohall, N. D.
- 974,746—Motor Vehicle. Charles A. Carlson, Brooklyn, N. Y., assignor to Carlson Motor & Truck Co., Philadelphia, Pa.
- 974,124—Tire for Vehicles. Alexander Crowe and J. E. Kinzel, Youngstown, Ohio.
- 974,250—Vehicle Wheel. Edmund J. Estey, Apponaug, R. I.
- 974,251—Demountable Rim. Edmund J. Estey, Apponaug, R. I.
- 974,765—Spring Wheel. George E. Garon, Manchester, N. H.
- 974,662—Vehicle Wheel Hub. Rupert L. Harrell, assignor of one-half to The Red Top Bottling Co., North Wilkesboro, N. C.
- 974,141-2-3—Vehicle Gear. Lester E. Hickok, assignor of one-half to the Cleveland Hardware Co., Cleveland, O.
- 974,144—Means for Detachably Supporting Vehicle Equalizer Bars. Lester E. Hickok, assignor of one-half to The Cleveland Hardware Co., Cleveland, Ohio.
- 974,770—Removable Rim for Vehicle Wheels. Arthur N. Hood, assignor to Hood Rubber Co., Boston, Mass.
- 974,668—Detachable Wheel Rim. Reiner Janclae and W. Kaulhausen, Aix-la-Chapelle, Germany.
- 974,387—Thill Coupling. Jules F. Jaquet, Ballston, Va.
- 974,155—Spring Wheel. Edson W. Jenkins, Alfred Station, assignor of one-half to C. M. Hayes, Hornell, N. Y.
- 974,399—Felly Joint Bridge. Alexander Lawrie, Pumpville, Tex.
- 974,579—Vehicle Headlight Steering Gear. Arthur G. Lindley, assignor of one-half to T. F. MacGregor, Schenectady, N. Y.
- 974,407—Axle Lubricator. Thomas Manners, Rice, Tex.
- 974,178—Tire Fastening Device. William B. Owen, Price, Utah.
- 974,709—Shock Absorber. Charles F. Rodin, San Francisco, Cal.
- 974,303—Cushion Tire. Edward C. Shilling, Columbus, Ohio.
- 974,713—Vehicle Wheel Tire and Rim. Selden L. Simpson, assignor to The Simpson Specialty Co., Cleveland, Ohio.
- 974,313—Vehicle Spring Support. Emory D. Toops, assignor of one-half to C. B. Clarke, Indianapolis, Ind.
- 974,773—Automobile Driving Gear. Charles C. Bettenhausen, Princeton, Neb.
- 974,861—Tire. Bailey B. Dawson, Lodge, Va.
- 974,777—Automobile Radiator. William Dietz, assignor to McCord Mfg. Co., Detroit, Mich.
- 975,220—Vehicle Tire. Stephen A. Douglas, assignor of one-half to C. L. Anderson, Ardmore, Okla.
- 975,343—Automobile Radiator. Jacob Fleischman, assignor of one-half to I. Fleischman, Jersey City.
- 975,128—Automobile Hood. John P. Gordon, Columbus, Ohio.
- 974,792—Thill Coupling. Jacob Hofstetter, Evanston, Ill.
- 974,798—Wheel. William L. Jacoby and F. B. Bell, Chicago Heights, Ill.
- 975,249—Shock Absorber. William A. Johnson, Chicago, Ill.
- 975,137—Removable Wheel Rim for Pneumatic Tires. Rudolf Kronenberg, Ohligs, Germany.
- 974,816—Spring Wheel. Myles W. Peck, Putney, London, England.
- 975,276—Shaft Driven Axle for Automobile Vehicles. Francois Pila, Lyon, France.
- 975,004—Fifth Wheel for Wagons. Walter A. Underhill, Auburn, N.Y.
- 975,207—Tire for Road Vehicle Wheels. Robert J. Caldwell, New

Southgate, assignor, by mesne assignments, to Pneumatic (1910) Limited, London, England.
 975,290—Driving Gear for Automobiles. John A. Scharf, Richmond, Ohio.
 974,942—Canopy for Folding Go Carts. William W. Williams, Indianapolis, Ind.
 975,189—Axle Nut. Joseph B. Wismer, Franconia, Pa.
 975,378—Vehicle Wheel. George E. Woodbury, deceased, San Francisco, Cal.; A. M. Haines, administrator.
 975,392—Running Gear for vehicles. Herbert E. Bradley, Kallspeil, Mont.
 975,829—Tire for Wheels of Vehicles. John Cairns, Willenhall, Eng.
 976,057—Carriage Curtain Fastener. William Esty, assignor to Esty Watch Tool Co., Laconia, N. H.
 975,414—Wind Shield. Joseph Hadka, Chicago, Ill.
 975,767—Demountable Wheel Rim. Raymond Healy, Brooklyn, N.Y.
 975,872—Radiator for Automobiles. Herman Klein, assignor of one-third to W. Reiter, New York, N. Y.
 975,538—Resilient Tire. Frederick Lamplough, London, England.
 975,442—Variable Speed Gearing. Robert Lindsay, Dundee, Scotland.
 975,630—Spring Wheel. Alfred Moore, Detroit, Mich.
 975,453—Wheel for Motor and Other Road Vehicles. Harry Perrins, Smethwick, England.
 975,588—Pneumatic System for Automobiles. Robert S. Wallace, assignor of one-third to G. G. Fix, Forney, Tex.
 975,816—Vehicle Tire. Adoniram J. Wilson, Westfield, N. J.
 976,620—Anti-Friction Fifth Wheel. Samuel C. Baucum, assignor of one-half to J. Grace, McAlester, Okla.
 976,149—Three-Horse Equalizer. William L. Carey, Upland, Ind.
 976,360—Vehicle Wheel. Bennett W. Hammond, Richmond, Cal.
 976,802—Automobile Wheel Hub. Charles T. Hixson and A. L. Tarrant, Ringwood, Okla.
 976,572—Tilting Body for Automobiles. Thomas B. Jeffrey, deceased, Kenosha, Wis.; K. E. C. T. and H. W. Jeffrey, executors.
 976,660—Spring Wheel. Daniel Kiser, Richmond, Ind.
 976,667—Spring Tire. Vernon A. Marsh, Endicott, Wash.
 976,591—Resilient Wheel. Henry E. Moebus, Boston, assignor to H. W. Brown, trustee, Brookline, Mass.
 976,686—Spring Wheel. Hans P. Petersen, Sioux City, Iowa.
 976,514—Tire Tightener. Robert B. Smith, Easley, S. C.
 976,614—Adjustable Wagon Rack. Andrew E. Sutherland, Madrid, Ia.
 976,710—Vehicle Wheel. Oscar Treier, New York, N. Y.
 976,762—Spring Wheel. James A. Wible, Oakdale, Pa.
 977,368—Spring Wheel. Zeno A. Bruegger and R. D., Culbertson, Mont.
 976,855—Axle. Walter J. Dunkin and G. R. Marley, Greenville, Ala.
 13,175—(Reissue) Vehicle Brake. George W. Fisher, assignor of one-half to L. C. Caltrider, Upperco, Md.
 977,093—Combined Carriage Pole and Shafts. Ethan J. Holmes, Farmington, Conn.
 977,195—Vehicle Wheel. William Q. Kennedy, Paterson, N. J.
 977,392—Spring Suspension for vehicles. Prosper Morren, Brussels, Belgium.
 977,346—Wagon Brake. John L. Tomer, Export, Pa.
 978,104—Vehicle Seat Lock. Edward M. Bauknecht, Martins Ferry, O.
 977,584—Joseph M. Benham and G. W. Slater, Oakland, Cal.
 977,585—Vehicle Tire. Percy B. Bosworth, assignor to Firestone Tire & Rubber Co., Akron, O.
 977,586—Fastening Means for Vehicle Tires. Percy B. Bosworth, assignor to Firestone Tire & Rubber Co., Akron, O.
 977,587—Detachable Fastening for Pneumatic Tires. Percy B. Bosworth, assignor to Firestone Tire & Rubber Co., Akron, O.
 977,588-9—Fastening Devices for Vehicle Tires. Percy B. Bosworth, assignor to Firestone Tire & Rubber Co., Akron, O.
 977,590—Vehicle Wheel Rim. Percy B. Bosworth, assignor to Firestone Tire & Rubber Co., Akron, O.
 977,520—Resilient Vehicle Wheel. Joseph Gavnor, New York, N. Y.
 977,570—Lamp Controlling Device for Motor Cars. Warren A. Greenlaw, Melrose, Highlands, Mass.
 978,019—Tire for Vehicle Wheels. Nehemiah Guthrie and C. L. Johnson, Dallas, Tex.
 977,737—Vehicle Wheel. William Haslup, Sidney, O., assignor to Sidney Steel Scraper Co.
 977,628—Tire. Howard H. Hodgson, Toronto, Ontario, Canada.
 977,031—Brake Mechanism for Automobiles. John G. Hopper, San Francisco, Cal.
 977,459—Singletree. Elmer Lust, Reasnor, Iowa.
 978,045—Spoke Socket. John Markwick, Scranton, Pa.
 977,463—Vehicle Wheel. Thomas L. May, assignor of one-half to E. G. Gooderham, Toronto, Ontario, Canada.
 977,559—Wheel. Michael C. Shea, Mishawaka, Ind.
 977,568—Wagon Tongue. Watson B. Stites, Hiawatha, Kas.
 977,484—Quick Detaching Whiffletree. Charles G. Taylor, Hartford, Conn., assignor to A. P. Richardson, Andover, Mass.
 977,492—Tire. Joseph A. Vitello, Abbeville, La.
 977,769—Vehicle Gear. Frank E. Wilcox, Mechanicsburg, Pa.
 977,846—Vehicle Wheel. Otto G. Worsley, Bangor, Mich.
 978,549—Tire. Junius A. Bowden, Los Angeles, Cal.
 978,243—Tire Armor. Arthur F. Walker, Herne Hille, and J. Gilles, Brixton, London, England.
 978,249—Vehicle Wheel. Albert Westphal, assignor of one-half to W. T. Gilles, Baltimore, Md.
 979,368—Axle Skeln. Andrew H. and C. W. Bevil, Warren, Tex.
 979,059—Whiffletree Coupling. Thomas J. Bullock, Freedom, Ky.
 979,265—Resilient Wheel. Lewis L. Daum, Canton, O.
 979,269—Vehicle Wheel. William H. Fahrney, Chicago, Ill.
 979,278—Vehicle Frame Suspension. Guido Fornaca, Turin, Italy, assignor, by mesne assignments, to F. I. A. T. Poughkeepsie, N. Y.
 978,881—Vehicle Frame. William S. Harley, Milwaukee, Wis.
 979,016—Shock Absorbing Vehicle Spring. Nicholas Luxembourger, Santa Ana, assignor to Bow Shock Absorbing Spring Co., Los Angeles, Cal.
 979,325—Tire. Henry E. Moebus, Boston, assignor to H. W. Brown, trustee, Brookline, Mass.
 979,032—Shock Absorber for Vehicles. William J. Pierce, Los Angeles, Cal.
 979,105—Hub Attaching Device. Ernest J. Spahr, assignor of one-half to O. Semler and E. Bohrmann, New York, N. Y.
 978,966—Back-up Brake for Vehicles. Dennis T. Walsh, Ansonia, Conn.
 978,976—Demountable Wheel Rim Holder, Louis Wolff, Jr., Chicago.
 Copies of above patents may be obtained for fifteen cents each by addressing John A. Saul, solicitor of patents, Fendall Building, Washington, D. C.

RECENTLY EXPIRED PATENTS OF INTEREST TO THE VEHICLE INDUSTRY.

Patents Expired May 8, 1911.

519,388—Vehicle Wheel. Homer N. Parker, Winchenden, Mass.
 519,564—Elastic Storm Apron for Vehicles. William M. Blanchard, Quincy, Ill.

Patents Expired May 15, 1911.

519,695—Device for Attaching Pneumatic Tires to Wheel Rims, Leonhardt H. Brunemeyer, Aurora, Ill.
 519,729—Wagon Brake. George M. McLaughlin and Charles E. Cooley, Westport, Mo.
 519,807—Wheel Hub. John W. Cloud, Chicago, Ill.
 519,790—Wheel. Edward Fox, St. Louis, Mo.

Patents Expired May 22, 1911.

520,126—Vehicle Body. Jacob J. Vollrath, Sheboygan, Wis.
 520,339—Tongue Support. Addison B. Rose and James H. Kelley, Palmyra, Mo.
 520,433—Carriage Top. Jeremiah P. Johnson, Detroit, Mich.
 520,476—Vehicle Spring and Axle Attachment. William Beckert, Allegheny, Pa.
 520,536—Pneumatic Tire. Joseph H. Pierce and Amos J. Dickson, Glenwood Springs, Colo.
 520,572—Dumping Wagon. Walter S. Phillips, Brooklyn, N. Y.
 520,750—Vehicle Shaft Support. Jeremiah J. Barker, New York, N.Y.

Patents Expired June 5, 1911.

520,806—Runner Attachment for Wheeled Vehicles. Silas C. Schofield, Freeport, Ill.
 520,813—Machine for Setting Tires. Jonathan B. West, Rochester, N. Y.
 520,830—Vehicle. David B. Price and Richard J. Daniels, Chicago, Ill.
 520,834—Thill Coupling. Fred Schelp, Jr., St. Louis, Mo.
 520,837—Die for Making End-Gate Rods for Wagons. Thomas W. Smith and John G. Price, Pittsburg, Pa.
 520,927—Two Wheeled Vehicle. John A. Johnson, Victoria, Ill.
 520,961—Vehicle. John Johnston, Hyde Park, Mass.
 521,005-6—Shield for Pneumatic Tires. Samuel M. Schindel, Hagerstown, Md.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word. Initials and figures count as words. Minimum price, 30 cents for each advertisement.

HELP WANTED.

Wanted—Body draughtsman on limousines, open body and trucks. Also foreman and assistant foreman of body department. Address The Pope Mfg. Co., West Works, Hartford, Conn.

Wanted—A No. 1 fire hand for my horseshoeing department. Steady job and good wages for right man. Address F. Chris Kramer, Savannah, Ga.

AGENTS WANTED.

Wanted—First class salesman wanted to carry our line of thill couplers and axles, as a side line. Something thoroughly tried and proven a great success. With our liberal commission all workers are making big money. For particulars address Chas. Schabinger, Marshall, Mich., stating territory covered.

Salesman Wanted—Hustling salesman wanted to sell carriages, cutters and sleighs. Address Michigan, care The Hub, 24 Murray St., New York City.

Salesmen Wanted—We have some good territory open. Would be glad to hear from any good hustling salesmen who would like to take hold of our line of carriages, cutters and sleighs. Address Lull Carriage Co., Kalamazoo, Mich.

FOR SALE.

For Sale—Two 42-inch Fay & Egan automatic late pattern spoke lathes; each complete with countershaft and four metal patterns and practically good as new. Would sell the two for \$300.00 or sell them singly for \$165.00 each. Address Louis E. Rechlin & Bro., 215-217-219 Butler St., Cincinnati, Ohio.

For Sale—Carriage wheel manufacturing plant, fully equipped, employing about 100 men. Business established in 1860. A bargain. Good reasons for selling. Address Lock Box 1095, Waterloo, N. Y.

PRICES WANTED.

Wanted—Bargain price on large West Tire Setter. Also large size wheel press. Must be in good condition. Baltimore Hub, Wheel & Mfg. Co., Baltimore, Md.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

THE SURPRISE IS YOURS

When You Open Your First Can of
MOORE VARNISH

Easy Working Perfect Flowing Long Lived
Highest Quality Under Every Label

BENJAMIN MOORE & COMPANY

Varnish Makers

New York Chicago Cleveland Toronto



ESTABLISHED 1886.

Correspondence School of Carriage and Motor Carriage Drafting

A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

Principal, THOS. MATTISON,
Hillside Avenue, Bitterne Park,
Southampton, England.

Author of "The Coach Body Makers' Guide," \$3.00; a practical treatise on "The Suspension of Carriages," "Bookkeeping," and other carriage building works.

PORTER'S BOLT CLIPPERS

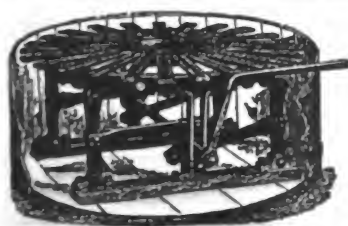
"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 inch.

H. K. PORTER,

EVERETT, MASS.



The Bokop Tire Setter and Cooler is the Best and Only Machine that has stood the test during the last 12 years on all classes of work, and is the Only Machine built with the Indestructible Wrought Iron Face Plate.

Over 1,000 are in successful operation, repairs on which have not exceeded \$6.00 in the last 12 years. For prices, references and descriptive circulars, address
BOKOP, WEBB & PALM,
Defiance, Ohio

Please mention "The Hub" when you write.

INDEX TO ADVERTISEMENTS.

Ault & Wiborg Co., The	6
Bailey & Co., Inc., S. R.	15
Bokop, Webb & Palm	11
Columbus Bolt Works	4th cover
Consolidated Rubber Tire Co.	2nd cover
Crane & MacMahon	2nd cover
Decker, J. C.	3rd cover
Devoc, F. W., & Raynolds Co., C. T.	3rd cover
Ecles, Co., Richard	14
Frost Gear & Machine Co.	4
Gerhab, Jacob	4
Gifford & Son, John A.	11
Goodrich Co., B. F., The	5
Goodyear Tire & Ruber Co.	12
Goshen Eyelet Co.	15
Gramm Motor Car Co., The	3rd cover
Hoopes Bros. & Darlington, Inc.	2nd cover
Hotel Latham	2
Jones & Co., Phineas	3-4
Keystone Paint & Filler Co.	4
Koller Co., J. B.	3rd cover
Masury & Son, John W.	2
Mayo Radiator Co.	4
Metropolitan Lamp Co.	15
McKinnon Dash Co.	4th cover
McIntyre Co., The W. H.	16-17
Moller & Schumann Co.	3
National Association of Manufacturers	13
New Wapakoneta Wheel Co., The	1
Oliver Typewriter Co.	14
Payne Co., E. Scott	15
Porter, H. K.	11
Racine Auto Tire Co.	14-15
Reilly, John, Inc.	2
Russell, Burdsall & Ward Bolt and Nut Co.	3rd cover
Standard Automatic Mfg. Co.	17
Timken Roller Bearing Co.	1
United Rim Co.	6
Valentine & Company	3
West Tire Setter Co.	3
Wiggers Furniture Co.	4th cover
Wilcox Mfg. Co., D.	18
Willey Co., C. A.	4
Woodman, Joel H.	15

Protected by the U. S. Supreme Court

All Products of The Goodyear Tire & Rubber Company Exempt From Claims of Grant Patent

THE recent decision of the Supreme Court of the United States, at Washington, in the case of the Consolidated Rubber Tire Company against the Diamond Rubber Company, sustaining the Grant patent, *while making other tire manufacturers accountable to the Consolidated Rubber Tire Company, in nowise affects the Goodyear Tire & Rubber Company*: for the reason that the Goodyear Company is *the only rubber tire manufacturer having had a final adjudication of its rights to make and sell, unmolested, both Plain and Wing-shaped Tires. Petition by Consolidated Rubber Tire Company for rehearing was twice denied by the United States Supreme Court.*

We are, therefore, in a position to give full protection to all customers, for past and future purchases, and have no royalties to pay on either the past or future, and, as a consequence, will not be compelled to either reduce our quality or increase our price. We stand ready to guarantee users of Goodyear Rubber against all loss and damage for past or future purchases.

Furthermore, we can and will stop the Consolidated or any other company, by injunction proceedings, should they in any way attempt to prosecute users of Goodyear rubber.

The Goodyear Tire & Rubber Company

Akron, Ohio, U. S. A.

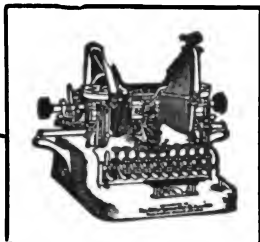
LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

SPRINGS

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN



17 Cents a Day Buys

The

OLIVER

Typewriter

The Standard Visible Writer

Can you spend 17 cents a day to better advantage than in the purchase of this wonderful machine?

THE OLIVER TYPEWRITER CO.

310 Broadway, NEW YORK, N. Y.

Carriage Mechanics

Desiring to improve their present
Condition should attend the

TECHNICAL SCHOOL

FOR

Carriage Draftsmen and Mechanics

SUPPORTED BY THE

Carriage Builders' National Ass'n.

The object of the School is to teach men to design vehicles and make working drawings, and to otherwise facilitate their work in the shop. Only those men employed in carriage or automobile building or their accessory trades are admitted to its privileges.

The classes are conducted in three divisions, viz.: Corresponding, Day, and Evening. The former is open during the entire year, while the day and evening classes are in session only from October 1st to April 1st.

The tuition is moderate.

For prospectus and full particulars, write to the instructor,

ANDREW F. JOHNSON,

18 West Forty-fourth St.,

NEW YORK CITY.

Please mention "The Hub" when you write.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and that's good news involved in the handling of

THE RACINE AUTO TIRE

We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

Advertisements Classified

The following list includes advertisers in THE HUB. Each advertiser is entitled to name under one heading only. An extra charge for name under more than one heading.

Axles

American Ball Bearing Co.,
Cleveland, Ohio.
Keagy & Lear Machine Co.,
Coshocton, Ohio.
Timken Roller Bearing Co.,
Canton, Ohio.

Automobile Radiators

Mayo Radiator Co., New Haven, Conn.

Bodies, Seats, Etc.

Kilvington, S. W., Wilmington, Del.
Wiggers Furniture Co., The Cincinnati, Ohio.
Woodman, Joel H., Hoboken, New Jersey.

Bolts and Nuts

Columbus Bolt Works, Columbus, Ohio.
Russell, Burdall & Ward Bolt and Nut Co., Port Chester, N. Y.

Carriage Forgings.

Columbus Bolt Works, Columbus, Ohio.
Eccles Co., Richard, Auburn, N. Y.
Indiana Forging Co., Indianapolis, Ind.

Carriage Hardware.

Gifford & Son, John A., New York.
Ochsner & Sons Co., A., New Haven, Conn.
Payne Co., E. Scott, Baltimore, Md.

Carriage Goods

Gifford & Son, John A., New York.

Higgin Mfg. Co., Newport, Ky.

Dashes, Fenders, Rails, Etc.

Rennett Mfg. Co., Alden, N.Y.
McKinnon Dash Co., Buffalo, N. Y.

Fifth Wheels

American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.
Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Finished Vehicles

Bailey & Co., Inc., S.R., Amesbury, Mass.

Gear Irons

Wilcox Mfg. Co., D., Mechanicsburg, Pa.

Gear Woods

Andrew Kimble, Zanesville, O.

Lamps

Gifford & Son, John A., New York.

Leather

Nelson, A. T. A., Co., Cincinnati, Ohio.
Reilly, John, Inc., Newark, N.J.

Lubricating Device

Aden Mfg. Co., Danville, Va.

Motor Trucks

Gramm Motor Car Co., The Lima, Ohio.

Machinery and Tools

Bokop, Webb & Palm, Defiance, Ohio.
Enterprise Foundry, The, Harvey, Ill.
Porter, H. K., Everett, Mass.
Standard Automatic Mfg. Co., New York.
West Tire Setter Co., Rochester, N. Y.

Miscellaneous

Goshen Eyelet Co., Goshen, Ind.
Standard Oil Cloth Co., New York.
Uehelmesser Co., Charles R. Bayside, New York.

Rubber Tires

Consolidated Rubber Tire Co., New York City.
Goodrich Co., B. F., Akron, O.

Rims

United Rim Co., Akron, Ohio.

Shaft Couplings and Anti-Rattlers

Eccles Co., Richard, Auburn, N. Y.
Metal Stamping Co., New York City.

Steel Socket Shaft End Co., Cleveland, Ohio.

Spark Plugs

Ball Multi-Spark Plug Co., Minneapolis, Minn.

Springs and Gears.

Keystone Spring Works, Inc., Philadelphia, Pa.
Spring Perch Co., Bridgeport, Conn.

Varnishes, Paints and Japans

The Ault & Wiborg Co., Cincinnati, Ohio.
Devos, F. W., and C. T. Reynolds Co., New York City.
Masury & Son, John W., New York and Chicago.
Moller & Schumann, Brooklyn, N. Y.
Murphy Varnish Co., Newark, N. J.
Valentine & Co., New York, Chicago, Boston, Paris.
Willey Co., C. A., Hunter's Pt., New York City.

Wheels

Crane & MacMahon, New York
Gifford & Son, John A., New York.
Hoopes Bro. & Darlington, West Chester, Pa.
Jones & Co., Phineas, Newark, N. J.
New Wapakoneta Wheel Co., Wapakoneta, Ohio.
Standard Wheel Co., Terre Haute, Ind.

Wheel Stock, Bent Wood, Etc.

Crane & MacMahon New York

Richard Eccles Co., Auburn N. Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile, Special

Send for Catalogue.

Please mention "The Hub" when you write.

CUSTOMER·A·SATISFIED·CUSTOMER

BECAUSE, those cup-like studs that you see in our illustration will grip the ground just where, and just when, the ground needs gripping; so that he is free from the danger of skidding and slipping.

BECAUSE, his tire EXPENSE account will show a difference such as will cause him to talk enthusiastically to others about you and the RACINE AUTO TIRE.

All this counts for good business; so get busy. The RACINE AUTO TIRE is going into the hands of live, pushing dealers. We shall make it equally advantageous to them as to us. Be amongst the live ones. Take our proposition. Do it now; and together let us do it thoroughly.

RACINE AUTO TIRE COMPANY

500 14th Street

RACINE, WISCONSIN



Goshen Eyelet Co.

Manufacturers of

Carriage
Top
Trimmings

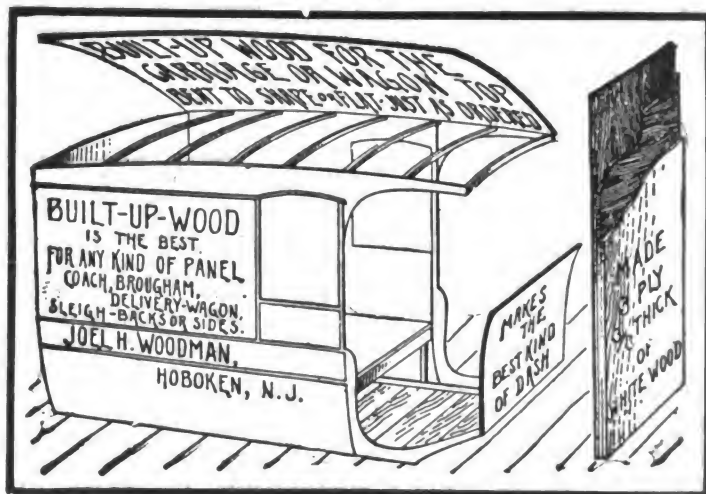
GOSHEN, INDIANA



E. SCOTT PAYNE CO.

OF BALTIMORE CITY
CARRIAGE AND AUTOMOBILE
HARDWARE

362 and 364 North Gay Street,
BALTIMORE, MD.



S. R. BAILEY & COMPANY, Inc.

Makers of the Celebrated.

WHALEBONE ROAD WAGON
AMESBURY, MASS.

H. WEICHHOLD

L. D. Phone 2290-W Market

METROPOLITAN LAMP COMPANY

Manufacturing and Repairing of

AUTOMOBILE SEARCH and SIDE LIGHTS, COACH and CARRIAGE LAMPS

Makers of All Kinds of Metal Goods.

Nickle and Silver Plating

24 Mechanic Street,

Newark, N. J.

WAKE UP MAN !

We want to get customers for you - bring 'em right up to your door ready to buy - all you have to do is to take down the order. We want to advertise the

McIntyre

\$1350

Commercial Power Wagon

FOR YOU



All advertising to be done over the name of the local dealer in his home paper

In most "selling campaigns" the manufacturer gets the best of it. Our campaign is to stand behind the dealer and inaugurate for him a "buying campaign."

We KNOW we have the greatest one-ton truck in the world.

We KNOW there are thousands of business houses who NEED it.

We propose to make that need FELT—to make it felt so strongly that it will stir to IMMEDIATE action men who are thinking of the commercial truck as applied to their own business.

THE BUSINESS IS THERE, THE TIME IS RIGHT THIS MINUTE, AND OPPORTUNITY IS KNOCKING AT THE DOOR OF THE DEALER

The kind of dealer we want is the kind that writes us NOW—our proposition is to fire his enthusiasm and enlist him in the kind of work that brings results. Get busy NOW you're the one we want.

Yours for business,

W. H. MCINTYRE CO.
AUBURN, INDIANA

Please mention "The Hub" when you write.

The Greatest Advertising Campaign Ever Used in the Sale of an Automobile Truck

\$1350

McIntyre

Commercial Power Wagon

The McINTYRE Commercial Power Wagon has proved its adaptability to every commercial need. It has been aptly called "The World's Greatest Power Wagon" and is making good wherever it is in service. There has never been a commercial power wagon made that—price considered—could compare with the McINTYRE.

On account of the popularity and increased sale of our power wagons, we have increased our manufacturing facilities and are in a position to consider applications on the part of live, up-to-date dealers. First come, first served.

Investigate the McINTYRE Heavy Duty Motor with the automatic governor, which absolutely prevents overspeeding—the source of 90 per cent. of all motor truck troubles. Note the following specifications and then write for further particulars.

Capacity—2,000 pounds.
Wheel Base—119 inches.
Tires—Solid rubber, 2½ inches.
Horsepower—24.
Cooling—Water-cooled.
Speeds—2 speeds forward, 1 reverse; 4 to 12 miles an hour.
Bore—5¼.

Stroke—4¾.
Mileage capacity per gal.—12 to 15 miles.
Ignition—Dual system, magneto and dry cells.
Equipment—3 oil lamps, horn, tools and jack.
Net Weight—2,200 pounds.

The Owner, not the driver controls the speed. Built for hard service.



WE SELL THE CHASSIS TO THE WAGON MAKERS.

If, we repeat, if you are a live, up-to-date dealer and have the facilities and ability to sell the greatest commercial power wagon ever built, you should immediately get into touch, by wire, 'phone or letter, or in person, with our sales Department.

This is one of the greatest opportunities ever offered to power wagon dealers.

Act at once! Send in the coupon now, before you lay aside this publication. Full particulars will be sent by return mail.

W. H. McINTYRE CO.
AUBURN, IND.

COUPON.

W. H. McINTYRE CO.,
Auburn, Ind

Gentlemen:

Please send full particulars regarding your national newspaper campaign, advertising your commercial power wagon over the dealer's name.

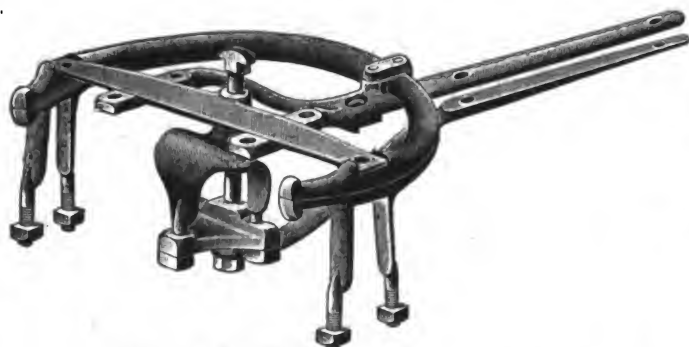
Name

Address

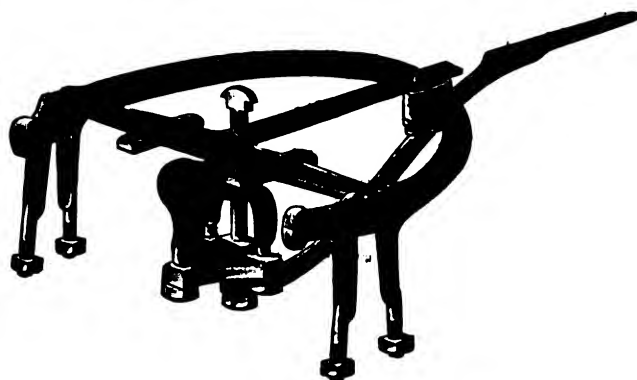
City

State (Hub)

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



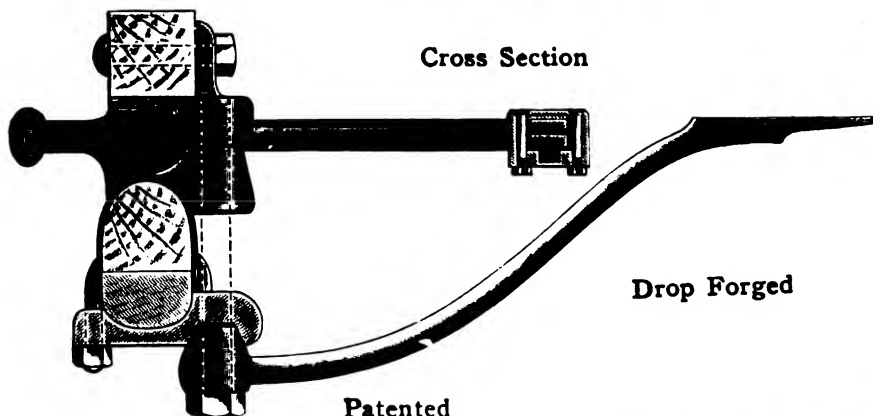
No. 1908—Gear Iron



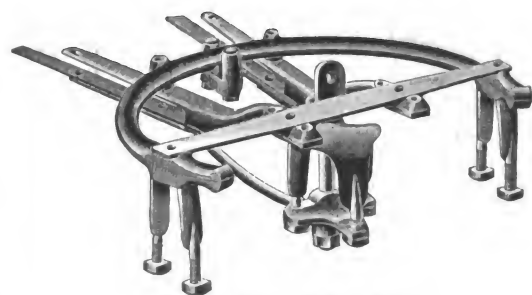
No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

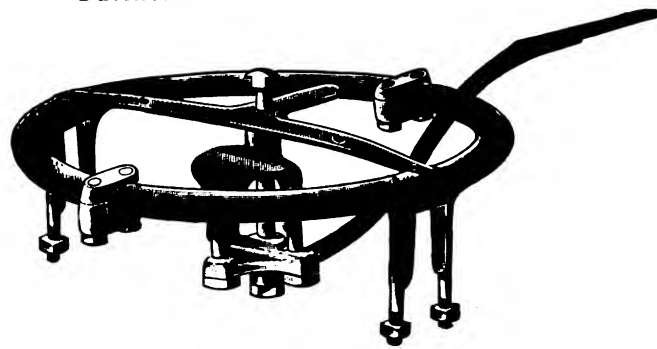
Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.



S
U
R
E
S
A
F
E



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

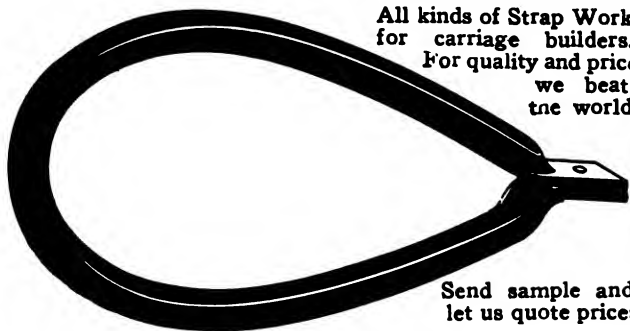
F. W. DEVOE & CO'S | COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S | COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES



All kinds of Strap Work for carriage builders. For quality and price we beat the world.

Send sample and let us quote prices

J. C. DECKER :

Montgomery. Pa.

J. B. KOLLER & COMPANY

Manufacturers of

FINISHED SPOKES

All Sizes for

SARVAN, WARNER, SHELL BAND AND WOOD HUB WHEELS.

HICKORY and OAK BENT RIMS

Mechanicsburg,

Pennsylvania



BOLTS Rivets, Carriage Makers' Washers and Burrs for all kinds of Vehicles
Russell, Burdsall & Ward Bolt and Nut Co.

Main Works, PORT CHESTER, N. Y.

Branch at Rock Falls, Ill



The Gramm is made in 1-ton, 2-ton, 3-ton and 5-ton models.

The GRAMM Was a Success Before Other Commercial Cars Came Into Existence

Ask any well posted man to tell you what commercial cars were prominent when the really great American pleasure cars were first making history.

"Well," he will say, "there was the Gramm."

And there he will stop. He knows the Gramm because a decade ago B. A. Gramm had marked out the way for other successful trucks to follow. The Gramm was a notable, practical achievement long before competing commercial cars came into being.

Those years of extraordinary experience are the Gramm's greatest asset; no truck buyer can close his

eyes to the fact that other trucks must pass slowly through the same trying period of development.

Wherever the Gramm has entered into a contest with other trucks, the value of that long experience in truck building was made clear.

The Gramm has not only made repeated perfect road and technical scores when handicapped with overloads, but IT WAS ALWAYS READY TO REPEAT ITS SUPERB PERFORMANCE.

In addition to the Gramm's efficiency, its marvelous records in economy tests offer the most powerful appeal possible to the shrewd truck buyer.

THE GRAMM MOTOR CAR CO.,

New York Headquarters: CROSS-MAGILL MOTOR TRUCK CO., 30 Church St., New York City. Let us send you our monthly "Gramm."

107 South Lima Street, Lima, Ohio, U. S. A.

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.

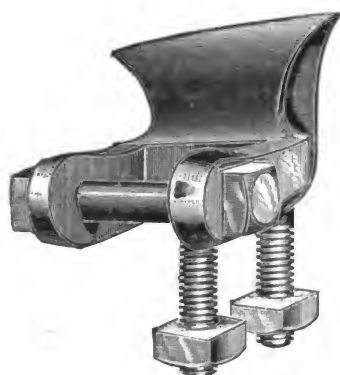


No. 332-B with Brass Rail.

A DASH RAIL

is as important a part of a dash as a
ROOF IS, OF A HOUSE

The Rail Protects the Top of the Dash



Skewed Shaft Couplings

**Regular or Oval Patterns
For High Arched Axles**

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{3}{8}$ or $\frac{1}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



A. H. WIGGERS
Pres. and Mgr.

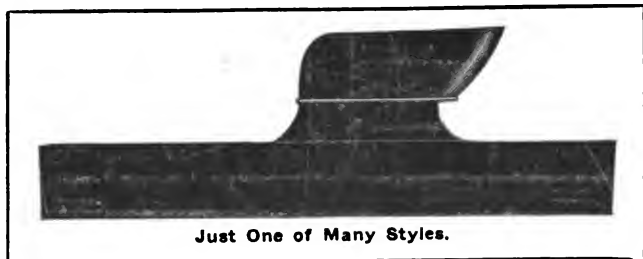
H. H. WIGGERS
Sec'y and Treas.

E. S. WIGGERS
Vice-Pres.

WIGGERS' BODIES

Automobile - Carriage

MERIT CONSIDERATION



Just One of Many Styles.

Because { THEY HAVE { Style
 { AND ARE { Quality
 { Well Seasoned
 { Made to Wear
 { Priced Right

Address

The Wiggers Furniture Co.

Manufacturers of Carriage
and Auto Bodies and Seats

1417 to 1423 Plum St.

Cincinnati, Ohio

Meritas Leather Cloth

**MERITAS
LEATHER
CLOTH**

MERITAS Leather Cloth won't blister or crack.
It has a permanent finish, dull or glazed, as you want it, that defies wear and weather.
The best seller because it gives best service.
Made in muslin, duck and drill, smooth and grained, black and colors for carriage or auto. Every yard guaranteed perfect by the MERITAS mark on the back. Look for it. At your jobbers.
Sample book? Certainly—write.

Standard Oil Cloth Co.
320 BROADWAY NEW YORK

The Hub



**AUTOMOBILES
CARRIAGES
MOTOR TRUCKS
WAGONS**



TRADE NEWS PUBLISHING CO
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN
STAR or KENNY
Sweet Concealed Band
WOOD HUB
WARNER

WHEELS

HEAVY and LIGHT
for
CARRIAGES
WAGONS and
TRUCKS

IF YOU WANT THE BEST TRY OURS



Load—Ten Tons of Coal.

SOLVED! Is the way motor car experts express themselves on the subject of tires for commercial motor vehicles after seeing and using the

KELLY-SPRINGFIELD SECTIONAL TIRE

With a grip on the road that means progress and security from the fault of solid tires—that of crowding the rubber ahead under load, which means disintegration—the motor wagon and truck owner will find in the Kelly-Springfield Sectional Tire the best tire for all heavy cars. Each section is dependent upon itself. If interested, write

CONSOLIDATED RUBBER TIRE COMPANY

New York, N. Y., and Akron, Ohio

Branches: Boston, Chicago, Philadelphia, St. Louis, Detroit, Cincinnati, San Francisco.



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT,  ACORN,  and STAR  BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO. RICHMOND, VA.

For Export Prices apply to the New York Office.



These 4 horses can pull 2 wagons

TIMKEN ROLLER BEARING AXLES

are guaranteed for two years. They earn 200 to 300% a year on their cost. You hold your customers, and every wagon with TIMKEN ROLLER BEARINGS sells another.

Write TO-DAY for Catalog and Price List.

THE TIMKEN ROLLER BEARING CO.
CANTON, OHIO

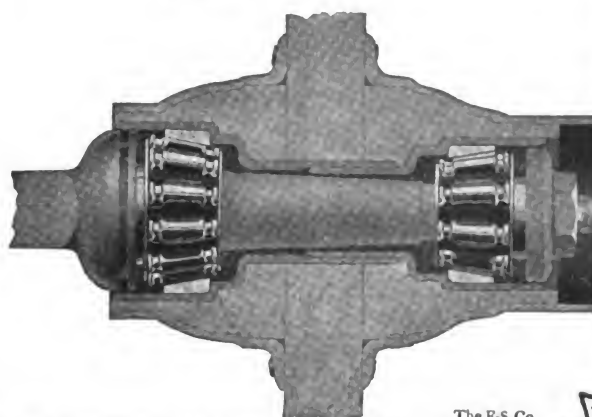
Branches:

68th & Broadway, New York.

1347 South Michigan Ave., Chicago.

When You Sell One Wagon
with
TIMKEN ROLLER BEARING AXLES
It Always Sells Another

Your customer cuts feed, shoeing and harness bills in two—reduces draft 50 per cent, and so can better afford two wagons with TIMKEN ROLLER BEARINGS, than one without.



The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Please mention "The Hub" when you write.

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York, Chicago, Minneapolis, Kansas City

HOTEL LATHAM

5TH AV. AND 28TH ST.

NEW YORK

For Permanent and Transient Guests

One block from Madison Square Garden

EUROPEAN PLAN

Sample rooms for commercial men

Table d'Hote Luncheon, 50c

CLUB BREAKFAST, ALSO A LA CARTE

ROOMS WITH USE OF BATH, \$1.50 PER DAY

ROOMS WITH BATH, \$2. \$2.50 \$3. \$4. PER DAY

**A. L. PRATT
MANAGING DIRECTOR**

JOHN REILLY Inc.

Established 1865

MANUFACTURERS OF ALL GRADES OF

LEATHER

FOR THE

Carriage & Automobile Trade

PARTICULAR ATTENTION CALLED TO

OUR AUTO SPECIAL

FACTORIES,

Avenues C & D, Murray & Astor Streets.
NEWARK, N. J.

AGENTS,

Cincinnati—National Hardware Co., Fourth Street
Detroit—C. W. Findlater, No. 313 Forest Ave., West

Please mention "The Hub" when you write.

MOLLER & SCHUMANN COMPANY

COLORED RUBBING

Most perfect as to working, drying and wearing.

CARRIAGE & AUTO VARNISHES

Send for color card and descriptive price list.

Chicago Branch - 110 N. Desplaines St., Office and Factory - BROOKLYN, N. Y.

The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE



Tires set cold in one minute. This machine saves time — does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim and

thus make the tire loosen prematurely. Saves re-sandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO., ROCHESTER, NEW YORK

Jones Wheels BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.
Newark, N. J.

TRADE **VALENTINE'S** MARK

Valentine's 1912 colors are now ready

They are one of the finest new lines we have ever put out and are sure to be popular.

Sign the coupon for color sample leaflet, free,

VALENTINE & COMPANY
257 Broadway, New York

Name.....
Address.....
Town.....
State.....
Cut off & mail to
Valentine &
Comp y

Please mention "The Hub" when you write.



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

¶ Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
New Haven, Connecticut

WILLEY'S COLORS

The **RECOGNIZED STANDARD**



C. A. WILLEY CO.
COLORS GRINDERS

and Manufacturers of Specialties in

**CARRIAGE, AUTOMOBILE AND CAR
PAINTS**

COLORS, VARNISHES, ETC.

HUNTER'S POINT, NEW YORK CITY

Headquarters for "The H. D. Smith & Co.'s" Carriage and Wagon Forgings

JACOB GERHAB

Dealer in

**Carriage Cloths, Leathers and Trim-
mings, Wagon and Cart Material**

Salable prices and all information cheerfully furnished.

158, 160, 162 and 164 North Third Street.
Philadelphia, Pa.

ESTABLISHED 1855

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

AUTOMOBILE WHEELS

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply the Standard Universal Quick Detachable and Quick Detachable Demountable Rims.

REPAIRING OF AUTOMOBILE TRUCK WHEELS.

GEARS

Our gears are theoretically correct, and give the maximum amount of satisfaction.

Are you enjoying this **BEST** service?

If not, **INVESTIGATE! NOW!**

FROST GEAR & MACHINE CO.
JACKSON, MICH.

KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

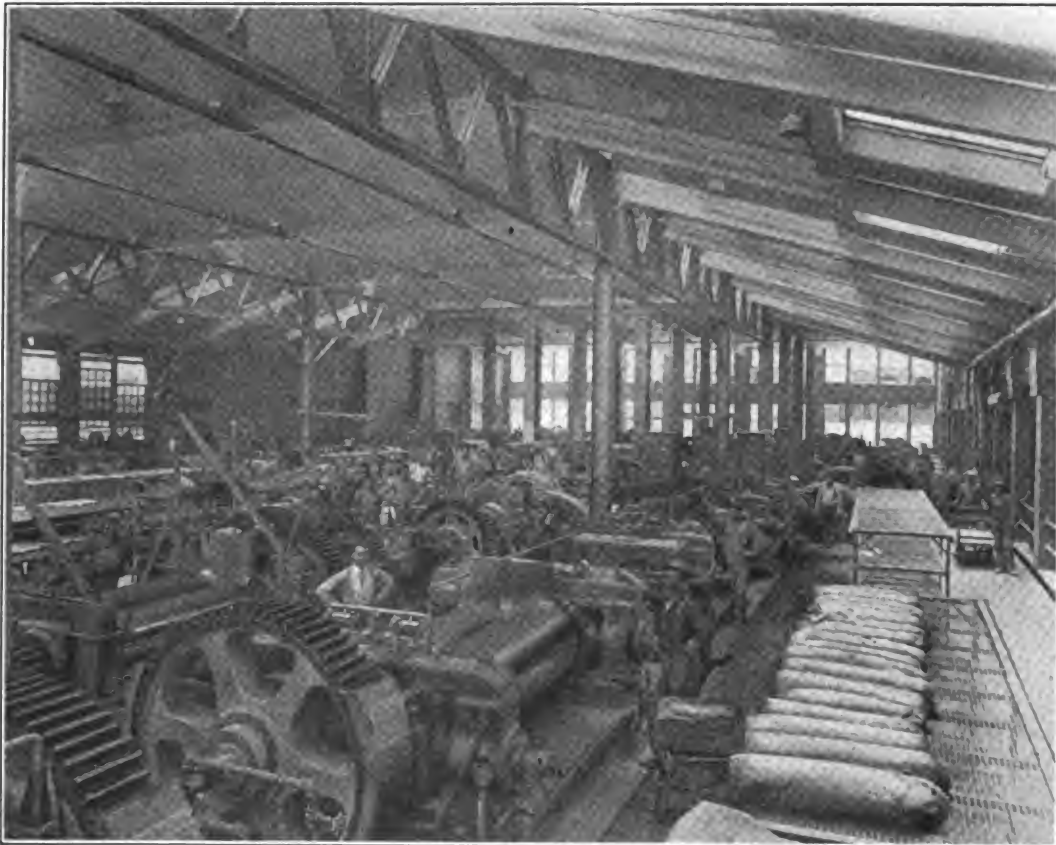
It fills the pores of Metal and Wood perfectly. Sandpapers easily and produces a fine, smooth surface that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

GOODRICH "SERVICE"

The Mill Room



Here the rubber is rolled or milled to give it proper consistency. This is the next step after the cleaning and drying of the crude. In other words, this picture shows the manufacture of rubber. Further on, the rubber is patterned into articles of sale, and cured.

This Department, representative of the equipment of the plant of the B. F. Goodrich Company, is the largest and most completely equipped Mill Room in the world.

The B. F. Goodrich Company

Akron, Ohio.

We Offer In **PROTEKTOL** The Ideal Paint Vehicle

PROTEKTOL is the result of careful study and scientific research for a carrier to produce a perfect paint film.

Paints made with PROTEKTOL as the vehicle, look better, wear better and last longer than any other paints now produced. They flow perfectly and dry to a smooth, elastic film, free from the pores so objectionable in linseed oil paints.

The inherent drying property of PROTEKTOL obviates the necessity of adding driers for outside work.

Convince yourself of the merits of PROTEKTOL by giving it a practical trial.

The use of PROTEKTOL means Perfect Paints as well as money in your pocket.

Write to-day for descriptive pamphlet.

70 Cents per Gallon.

Branches:

New York, Philadelphia
Buffalo, Toronto
Montreal, Buenos Aires

THE AULT & WIBORG CO.
VARNISH WORKS
CINCINNATI.

Branches:

Chicago, St. Louis.
Minneapolis, San Francisco
Mexico City, London, Eng.

Type 2—For ALL Straight Side and Clincher Tires. (Clamp Unlocked.)



**STANDARDIZATION
OF RIMS THAT
BENEFITS**

**CAR BUILDERS
TIRE MAKERS
CAR OWNERS**

Type 3—For ALL Clincher Tires (Wedge in Position).



The Standard Universal Quick-Detachable Demountable Rims

"FIT ALL TIRES" and SOLVE THE PROBLEM OF INTERCHANGEABILITY

25,000 Sets of Demountable Rims and 135,000 Sets of Quick Detachable Rims; practically 96% of the total number of Rims made in the United States, have been contracted for by 100 leading manufacturers.

Type 1—For ALL Straight Side and Clincher Tires. (Clamp locked.)



Write for illustrated descriptive matter.

**THE UNITED
RIM COMPANY**
AKRON, OHIO

Type 3—For ALL Straight Side Tires (Wedge in position.)



Please mention "The Hub" when you write.

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

AUGUST, 1911.

No. 5.

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President.

G. A. TANNER, Secretary and Treasurer.

24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00

AMERICAN HARNESS AND SADDLERY

DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Not the Technical Man Who Makes the Forward Step.

We have maintained that improvements that are not merely refinements, in short, the archaically new, seldom come from the work of the high-brow in the chosen field of endeavor.

The recent instance of this fact is the testimony of Knight, the inventor of the sleeve valve gas engine. We quote his words in a paper read before an English automobile club some time ago:

"I have no doubt that had I come into contact at that time with some of the critical experts whom it has been my good fortune since to meet I should have been dissuaded from spending a dollar upon the idea, yet, in the light of recent startling mechanical and scientific developments, I have almost reached a state of mind when I hesitate to entertain or express doubts regarding the possibilities of any reported accomplishments. * * * Frank Munsey, one of the world's most successful publishers, in a treatise on the subject of 'Schemes' for increasing the volume of business, said; 'If you have an idea and have confidence in yourself go ahead and work it out. It's all well and good to look around and see just what is the condition of the channel ahead of you, but if you have any hope of being successful don't by any means call in a dozen advisers and discuss your scheme with

them. The best idea that was ever born can be talked to death around a council table. If you expect to devise anything that does not involve some risk you are smarter than the average smart man. If you have an idea and have confidence in yourself it is up to you to grasp the situation vigorously and surmount the obstacles. Counsellors will undoubtedly point out stumbling blocks. It is for you to get over these. Any man can do an easy thing. Ability means the power to do things other people think cannot be done or fear to undertake.'"

The "expert" class are more inclined to travel trails that have been blazed than to strike out in new directions. They seem to want to use microscopes to refine the already refined, rather than disturb the status quo with a new idea. The new ideas come from the men, as a rule, who are not burdened with so much technical lore that they know in advance that something can't be done because it is not according to accepted practice.

Many of the improvements in vehicle building were the outcome of the efforts of men who were very deficient in scientific knowledge, but they took the step in advance and the others marked time until it became easy to catch up after being taught how to do it.

A high-tensioned scientific man is just first rate for working out details and perfecting the ideas and ideals of some man who really thinks.

Water Stopped Them.

An interesting incident that happened in England on Derby Day was the stoppage of cars due to a heavy down-pour.

Rain found its way under the bonnets, flooded the air-intake pipes to the carburetor and short-circuited the magneto current.

The patient horse had to come to the rescue and haul the cars out of the road to leave room for the pressing vehicular traffic.

Good Roads.

If the good advice coming from so many directions is acted upon, there should be a wonderful improvement in roads in every part of the country.

The most forbidding aspects of some highways have been taken in hand expertly and it is demonstrated that they may be improved beyond recognition by simple expedients that call for little cash expenditure. Where the money is ample permanent ways have been undertaken that are a benefit and will so continue for years, with a proper apportioning of some of the burden of cost on the posterity who will enjoy the benefit.

The splendid dirt highways across the state of Iowa

maintained in a state of constant excellence despite the elements by means of road drags, are yet another example of what can be done with little money but much determination.

The Carriage Builders' National Association can do some real pointing with pride in view of its pioneer efforts for good roads. If the association had done no other thing, this movement alone would have richly justified its reason for existing.

Sum in Arithmetic.

A man who likes to juggle with figures and arrive at interesting conclusions has been attracted to the subject of the "spare" tire that is part of the equipment of most automobiles.

He assumes there are five hundred thousand machines in service carrying spare equipment as an emergency asset, and that the cost of a tire is \$47. This figures out over twenty-three million dollars tied-up capital.

Then he figures the depreciation of such stock is about eleven millions before it comes into play.

As to weight, if the tire weighs twenty-five pounds the machines become, in a sense, commercial propositions, as they trundle around with twelve and a half million pounds of weight present and unpleasantly accounted for.

If a car is driven five hundred hours a year at twenty miles an hour, it will also consume over four million horse power to carry the spare tires.

The thought occurs, why not equip with tires in the first instance, at larger initial cost, to become a sufficient factor of safety, and avoid such possible expense.

Its Sixtieth.

The enterprising New York Times is about to celebrate its sixtieth anniversary with a "supplement," and it is to confine the use of its advertising advantages to such business ventures as have had at least a sixty-year business life. This is somewhat novel as an exclusion feature, and will lend distinction in several ways to such as can enjoy the privilege of space in such an issue.

The Curiosities of Advertising.

It is often thought that the advertising pages edit the common run of class journal, but we are disposed to the belief that such journals are much freer from such influences than they are given credit for. The class journal of to-day is conducted on ethical lines much more exacting than the daily press.

Here is an interesting instance that serves to point the pretention. We think the item is alone sufficient to explain what is meant:

A certain important Paris daily, having the largest circulation in the world, is to be congratulated on the original manner in which it announced the results of the kilometre trials at Boulogne. They were given as follows:

1. Boillot, on Lion Peugeot. Oleo spark plugs, Claudel carburetor, Michelin tires, Automobile spirit.
2. Wagner, Michelin tires, Automobile spirit.
3. Burgess, Automobile spirit.

4. Robinson, Automobile spirit.

As L'Echo des Sports quaintly remarks: It is not surprising that Boillot won, for the above list showed that this skilled driver was well equipped for running the race, having a car, tires, carburetor, plugs and petrol. But what about the unfortunate Wagner, who came in second, with nothing but a set of tires and some petrol, or the poor Englishmen, who evidently did the kilometre on foot, carrying a can of petrol?

Tomato Seed Oil.

It is almost confusing to keep track of the substitutes for linsed oil as a constituent part of varnish. The latest to come under notice is oil from tomato seeds, which an enterprising canner of Italy has found to be fine for use in making varnishes. The output of this new product is over six hundred tons per year. If the chronicler of this find had only added that the seeds yield an oil the color of the ripe fruit, then we could have had a color-and-varnish discovery of much interest.

China nut oil is also knocking at the door, and is said to be substituting for linseed oil with satisfactory results.

In all this we have not heard a word from a real maker of good varnish as to what is his opinion of these attractive substitutes.

THE BAD GLUE MAN.

A very interesting little publication to which we are indebted for about all that is worth knowing on the subject of glue, says the sellers of the article, meaning, we suppose, the glue salesmen, are more "sticky" than they ought to be at times. We will let "Glue" tell about it, and thus avoid unpleasant possible consequences:

Fooing the consumers in adhesives is an easy game, and it is done every day in thousands of cases all over the United States --and in various ways. Anything connected with glues offers the chance, and opportunity will not be wasted.

A favorite scheme is to offer assistance in the line of glue testing and glue handling and if such services are rendered without any bill for the work done, they are usually accepted.

In all such cases the assistance offered serves the purpose of ingratiating the person who helps the glue user, and thus paves the way for the sale of something; and that is where the kind hearted gentleman who serves his brother free of charge gets his pay--and it is not a poor pay reward he reaps either.

In some cases the "glue-wise" man works as a glue expert, perhaps calls himself "chemical engineer" though his career has been that of a glue agent, and the only right he has to the title of engineer is derived from the number of schemes engineered.

For the glue user who cares to know, it is easy enough to find out the facts almost in any case, on account of one fortunate circumstance, this namely: that no reputable glue house practices any such methods. If the consumer therefore wants to know the merits of any such scheme or advice offered, he can find out all about it if he asks his glue house; they know glue--they made it their life's work to handle this article--and they are posted.

The consumer must therefore blame himself if he is fooled, and must be told that the reasons why he is such an easy victim are these:

That he believes he knows all about glue.

That he thinks he can get professional assistance free of charge, and--

That the cheapest outfits and the lowest priced labor is good enough for the glue room.

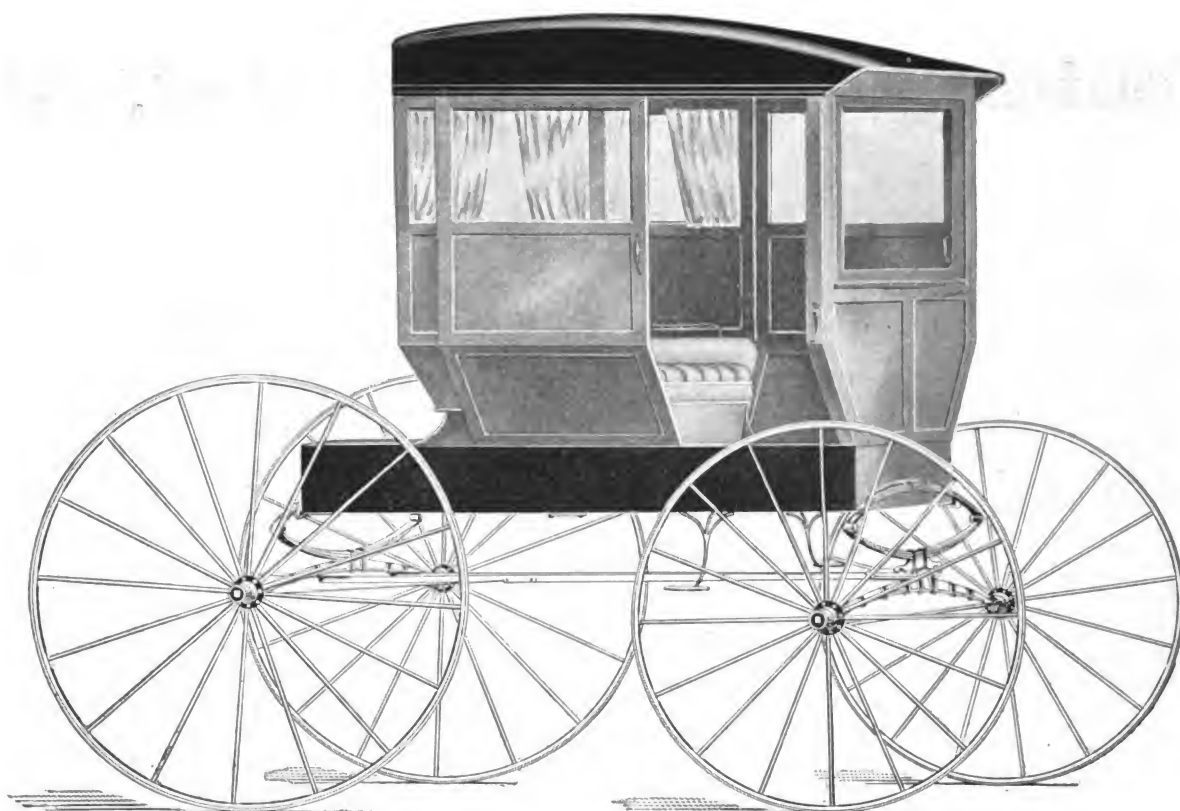
Vehicle Fashions for August, 1911



THE LATEST WINTON SIX-CYLINDER.
From the Winton Motor Carriage Co.



**We Are in a Position to Entertain a
Portion of the Carriage
Builders During Their
Convention Week**



From the Storm Queen Buggy Co., Wabash, Ind.
STORM FRONT BUGGY.



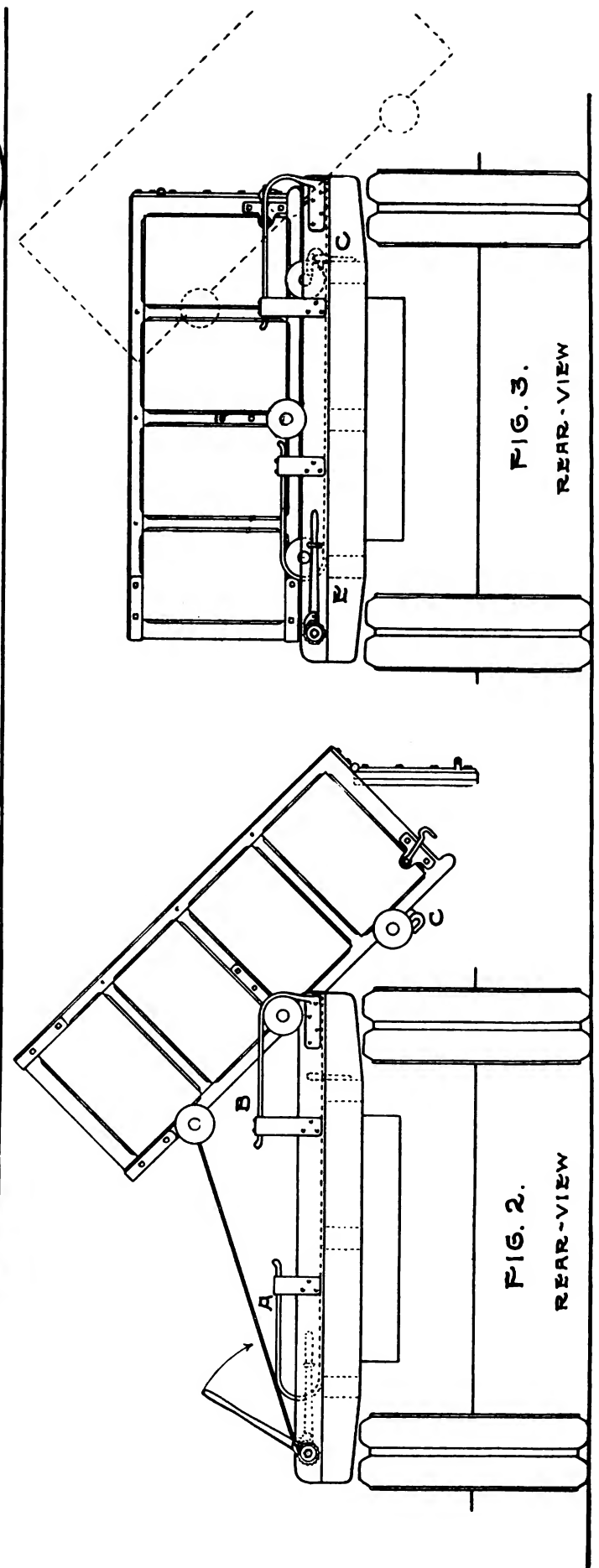
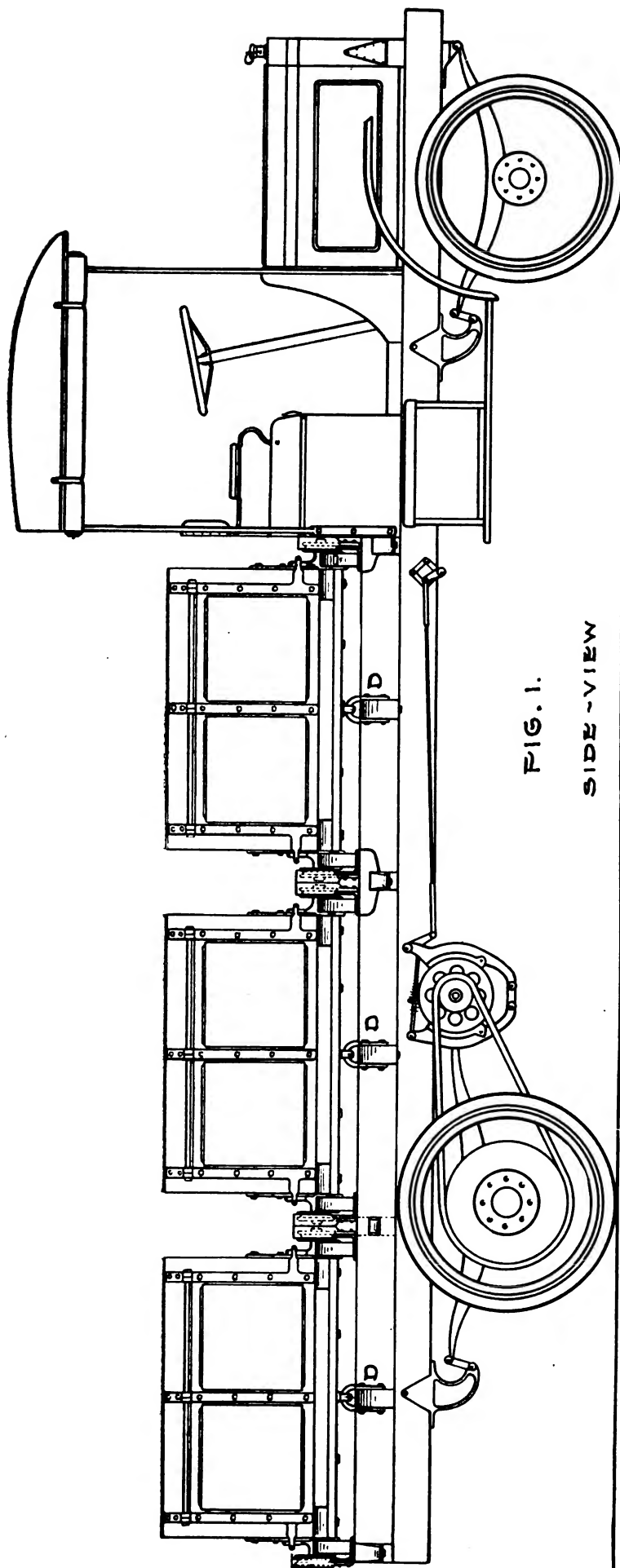
PIANO BODY AUTOMOBILE SEAT TOP BUGGY.
 F. C. H. Manns Engraving Co., Cincinnati, O.



AVERY COMMERCIAL TRUCK.
From the Avery Company, Peoria, Ill.



MOTOR HORSE AMBULANCE.
From Commercial Truck Co., of America, Philadelphia, Pa.



INDIVIDUAL THREE-TON DUMPING MOTOR TRUCK.

Wood-working and Smithing

INDIVIDUAL THREE-TON DUMPING MOTOR TRUCK.

(Illustrated on Opposite Page.)

This drawing illustrates a truck designed to deliver coal or similar material in one ton lots to different customers and is so constructed to provide side dumping facilities. Each of the three bodies are distinct from one another and individually operated. The truck has 14 feet wheel base and 14 feet body space back of driver's seat.

The tracks upon which the body travels consists of 4-inch angle iron securely bolted crosswise to the framework or platform of truck. Each body moves on six pair of rollers or wheels, the two center ones of which are grooved to receive the vertical member of the angle and act as pivoting points in dumping the body. The other four wheels are flat faced and travel over the horizontal member of the angle.

The iron A is turned up to receive the roller and thereby hold body securely in place, it being of sufficient length to keep body to track until center rollers become engaged with iron B. Hook C is bolted to underside of body and engages with an eye or loop as more clearly shown in side elevation, Fig. 1 at D, its object being to lock body securely to the frame. The bodies are drawn back individually by means of a steel cable or chain attached to a roller and operated by means of a lever and ratchet.

Fig. 2 shows the rear view with the body in dumped position inclined at an angle of forty-five degrees, while Fig. 3 shows it in its normal position and locked in place by means of lever E.

THE LATEST WINTON.

(Illustrated on Page 125.)

The neatness and efficiency of design shown in the example of the new Winton type is fully up to all previous Winton excellence. The builders are what we should like to designate as conservative-progressives. They saw early the unworkmanlike appearance of outside levers; they had a gentleman's repulsion to getting out and doing a job of undignified "cranking," they soon became convinced of all the advantages of a six-cylinder engine, and having become well convinced have just gone ahead making good better.

RAIL BODY FURNITURE WAGON.

(Illustrated on Page 125.)

This wagon for furniture carrying is well designed to carry a big freight with convenience and safety, and the body and gear parts are not too heavy. It is a good example of designing to fit the purpose.

THE AVERY TRUCK.

(Illustrated on Page 127.)

This truck, built by the Avery Co., at Peoria, Ill., is making a very handsome record as a durable outfit.

The very narrow front part of the chassis is a commendable feature, allowing of somewhat wider play for the turning radius of the wheels. It works well in narrow streets.

The Avery Company are old hands at the traction engine business and have brought a wealth of experience to bear in design as well as trustworthy construction.

The Avery cooling system consists of a honeycomb radiator in front and an auxiliary radiator underneath the platform, with a positive gear pump which keeps the water in circulation even

when the water is running at a low rate of speed, and whether the water is cool or warm. The cool water is forced through the manifold and enter the cylinders near the valves, thus the coolest water strikes the hottest part of the cylinders. In connection with this system is also used a fan, driven by a one-inch belt from a pulley, and having a device by which the tension of the belt may be instantly adjusted should the belt become stretched.

STORM FRONT BUGGY.

(Illustrated on Page 126.)

This very sensible construction has proved its worth by its popularity. Almost every one has a try at the model. The example shown from the Storm Queen Buggy Co., of Wabash, Ind., who are specialists in this class of work, and have tried out their model well.

AUTOMOBILE SEAT TOP BUGGY.

(Illustrated on Page 126.)

The illustration of this buggy is from the art establishment of F. C. H. Manns Engraving Co., of Cincinnati, where so much that is meritorious in illustration has its origin.

MOTOR HORSE AMBULANCE.

(Illustrated on Page 127.)

The "cart before the horse" is here turned from a phrase to a fact. This ambulance is one meeting with workable success in Philadelphia and is from the repository of the Commercial Truck Company of America. It is used by the Humane Society. The power is applied from the front wheels, as well as the steering, the body of the vehicle being of the usual solid axle construction, large wheels, and tire-applied brakes, so familiar and good for its purpose.

MAKING A STRETCHER.

There are times when a trimmer is called on to make a stretcher for an ambulance—and there are many different kinds of stretchers. There is the straight stretcher, which is framed up of wood, with rollers on the bottom to slide into the ambulance. This stretcher is covered plain, the goods being drawn on smooth and tight and tacked all around the edge of the frame. But this style stretcher is unhandy to carry into a house or upstairs, so that a stretcher to be used in conjunction with the above, that is, designed for the purpose of carrying the patient up or down stairs, is herein described.

This stretcher is made of heavy duck, with thin wooden slats for stiffening and a handle of heavy leather at each corner. To make this stretcher, cut a piece of duck about 6 feet, 4 inches long of 4-foot wide duck; fold this piece over, which makes the duck for stretcher double. The stretcher finished should be 22 inches wide by 6 feet 1 inch long. When piece is doubled over and edges turned down the proper size, mark stretcher off for slots. These are pieces of hickory about $2\frac{1}{2}$ inches wide and $\frac{1}{4}$ inch thick, bevelled off at each side, which makes them light looking. There are 8 or 9 of these slats in a stretcher, each about 4 feet long.

To place these slats in position, says Cooper's Journal, first mark off the duck; mark down 18 in. from one end and draw a line, make a mark about 6 in. from other end, this making the space which slats are to lay in; then measure off space across the goods. When all marked stitch on machine, stitching around edge, except on one end. Then stitch all around lead

pencil mark, leaving one end open through which to slide the wooden strips.

When all stitched place the strips in place and finish stitching up the end; then the four handles are put on stretcher. First place two brass grommets at each corner, and, when these are in, cut a piece of heavy harness leather the width of grommet, so that the leather can be drawn through grommet. Blacken the edge of the leather and pull it through the grommets, allowing the leather to be long enough to make a good sized handle and then rivet the leather together close to each grommet, thus forming a good handle for this style of stretcher.

When the handles are complete, place three straps and buckles on stretcher to hold the patient safely thereon. These are made of a 1-inch strap and buckle riveted fast to the stretcher and long enough for one to fit around the chest of patient, one around stomach, and one around the legs. When these are attached, the stretcher is complete, making a good appliance for the purpose of carrying the patient out of a house and into an ambulance. This stretcher can be laid on top of the regular stretcher, taking very little space.

LIGHTING SHOPS.

In speaking of any work room it is a point well made to say the light is good. It is not a matter carefully studied, but it is important. The chief trouble is with the artificial lighting, and it presents some features not always clearly understood.

There is some fog as to the placing of lamps, for instance, high or low. If lamps are designed as they ought to be for a specific purpose, it makes little difference if they are high or low in the measured amount of the light given.

As having regard for the workman's eyes it is better that lamps should be high slung, and if measurements are correct, there will be less shadow cast on the work in hand.

This is explained by an expert in light this way:

Suppose we want to spray a certain number of gallons of water per minute over each square foot of a certain room; suppose, also, for our first example, that we suspend a number of nozzles at regular intervals over the room at a height of four feet, while as a second example, we suspend them at ten feet.

If we hang them four feet high, each nozzle must spray over a much wider angle than if suspended at ten feet, or if the nozzles are not changed when the height of ten feet is reached, each part of the room will be receiving water from several nozzles. The amount of water falling on the floor will not be changed by the height at which the nozzles are hung; the height only affects the area over which water is being sprayed.

In the ordinary case in which lamps equipped with reflectors are hung at regular intervals over a large room, the effect of raising the lamps is simply to increase the area over which the light from one lamp is spread. When the lamps are high, the light from the various lamps overlaps at many points, but the total light is the same.

This overlapping is very desirable, as it tends to eliminate shadows from any one lamp. On the other hand, if the lamps are not equipped with reflectors, and do not give distribution of light mainly downward, raising of lamps causes a larger proportion of the total light to be directed toward the walls and ceilings and hence there is loss by reflection back and forth between walls and ceilings.

CUT UP STACKS OF GEAR WOOD.

The Cooper Carriage Wood Work Company, of St. Louis, Mo., is a busy concern when the saws are buzzing. It eats up something over 800,000 feet of choice stock daily to turn out the 750 sets of gear woods, and now they are working on a basis of 1,000 sets per day.

A big advantage to the purchaser comes from the quantity scale of this work, as there is lumber enough always to make the right selection for the right class of work. Any one who is

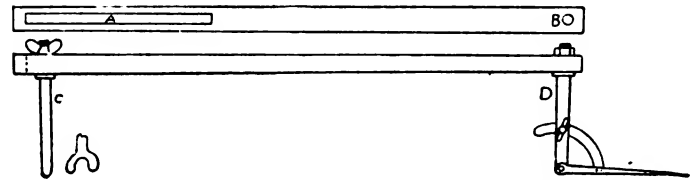
a woodworker gets right to this significant fact in a few jumps.

Dealing with big people, other matters being on a level, gives one all the advantage of the right selection of the material for the work. It is important.

MAKING AN AXLE GAUGE.

The engraving shows an easily made axle gauge that is inexpensive and yet serves the purpose. To make it, take a piece of hardwood about one inch thick by 1½ inches wide and about as long as the longest axle that comes into your shop. In one end of this piece cut a long slot or hole as at A in the engraving and at the other end bore a hole as at B. Now forge a forked rod as shown at C, one end forming the fork and the other end being threaded to take a thumb nut. A washer is welded on to the threaded end of this rod so that with the aid of the thumb screw it will grip the wood tightly when in use. This rod is shifted along on the wood bar to accommodate different lengths of axles.

The rod D is made from an old buggy top joint. This rod is fitted with washer and thread the same as the forked rod. If not long enough it may be lengthened by welding a piece on



at the upper end. The joint is then fitted with a quadrant similar to a pair of dividers, the stationary part of the rod being fitted with a thumb screw at the point where the quadrant passes through it. This arm is arranged in this way so as to allow for different adjustment to different angles.

In use, place the rod C on the spindle of the axle and against the collar. The other end D is placed on the other spindle with the joint of the rod up against the collar. When the axle is set just right, mark the quadrant at the thumb screw. Then get the gage and mark that on the other side of the quadrant. You now have a guide for any other axle with the same dish of the wheel and for the other end of the axle, and by this means you can save yourself much time.

EFFECT OF LARGE WHEELS ON TIRES.

As regards the advisability of fitting larger tires to a car it should be remembered that there are several factors bearing directly on tire depreciation. One of them is the abrasion of the rubber on the road surface, another is the rotting of the fabric due to the ingress of water through cuts, and another, and probably the most important, is the effect of fatigue of the fabric caused by excessive or frequent bending of the walls to a curvature which strains the fabric. While increasing the size of wheels, in order to allow of larger tires being fitted, undoubtedly increases their weight, and this apparently tends to increase fatigue, the increased size operates to allow of a larger vertical movement of the tire without curving the walls to an extent which is objectionable and so relieves the stress. The larger tire area in contact with the ground also decreases the pressure per square inch at that particular point.

CEMENT FOR FASTENING GLASS TO METAL

One of the best cements for uniting glass to other substances consists of a mixture of gum and calomel. Its adhesive power is something marvelous. It is prepared by putting the very best and purest gum arabic into a small quantity of water and leaving it until the next day, when it should be of the consistency of treacle; enough calomel is then added to make a sticky mass. It is to be well mixed on a glass plate with a spatula, and must be used at once, as it hardens in a few hours.

HALF-HEADED LIMOUSINE BODY.

(Illustrated on Following Page.)

As a design of motor body the limousine has held a front rank place. The most expensive cars are built on its lines whether wholly closed or with half head, as a landaulette, the controlling lines of the limousine design are predominantly followed.

The digressive lines in design are much more marked in motor bodies than ever was the case in horse-drawn vehicles. The whirling speed of motor traveling and the transitory character of motor carriage design all beat back to the generative character of the motor, which means speed and change, hence motor body design is on a faster plane of change than the building of horse carriages ever was.

The design in the working draft which we give here possesses all the room in the hinder part that a limousine of medium size can give, the top back quarter being largely cut up with a coach side light, while the door is also on lines of the coach body, which are points adding character to the lines of the design.

The front quarter is made with a high elbow line, and is also coach-bottom quartered. The body is made flush sided with plain quarters, which are cut up with waist belt panelling. In high class body building the mouldings should be all worked up in the solid. There are mouldings that must be planted owing to design and constructional causes, but in such cases the pins should be of brass, so that corrosion cannot be set up on the heads and the painting destroyed in their immediate locality.

The chauffeur's seat and front body is protected with a half canopy hood. The rear seat is fitted with a valance plate, and secured to the roof of the body with outside head locks. The canopy is made portable from the boss of joint stay on elbow, but the hood is much better kept permanently to the body, for then the chauffeur is always under protection from heat or weather, while it gives a complete finish to the car's fitting, and harmonizes with the body's design. The body is made with rounding corners in the back quarters. The elbows are made in return curves, and the panel moulding to match. The chauffeur's gearing is partially covered with a shield bonnet, projected from the front extreme quarter, while at the same time, its shape gives an artistic blending to the lines of the body generally.

Fig. 1 Shows the elevation design complete.

Fig. 2 shows the half back section which shows the design of the back and the lines of the mouldings from the elbow, and the widths across the body from the standing pillars, also from the center of the body, and the rounding lines of the corner. The rocker boot side is fixed to the inside of the standing pillar line, and is half check framed to the bottomside, and screwed up from underneath. This method of fixing has been often explained in *The Hub's* working drawings. The top back light is made spacious to harmonize with the side lights of the quarters.

Fig. 3 shows the half plan of the body which is flush sided—the bottomside from the center of the turnunder line to the shoulders of the cross bars is all in one piece, and is cut out with projecting curve pieces to half check frame to the standing and shutting pillars. This method of construction has also been explained in previous issues. In the plan, the rounding corner of the back quarter is fully drawn out, and the seat line curve is drawn in true proportion to it, taking in the seat line behind, and the turnunder line on the side of the body on the seat line. The position of the turnunder line is projected from Fig. 2 and star propped off, while the spacing of the doors are projected from the elevation.

The sizes are: Length of body on chassis, 8 ft. 8 in.; width of chassis, 35½ in.; width of body on chassis across rockers, 36 in.; width of body across standing pillars, 50 in.; across center of body, 52 in. The center of the corner circle can be measured off from the plan and run into the top and seat bottomside curves. The front or shutting pillars are in the center of the body and

are therefore at that point 52 in. across; width of body on seat line bottomside on plain pillar, 49½ in.

Extreme length of hind quarter on elevation, 32 in.; on elbow line 31 in.; on bottomside line, 27 in.; depth of rocker boot side, 14½ in.; length of rocker on seat bottomside line from back of pillar, 20½ in.

Width of door, 23½ in.; depth of hind quarter over mouldings to underneath elbow 16½ in.; width of belt panel from underneath elbow over moulding, 4 in.; width of neck of standing pillar at bottomside, 4½ in.

Full depth of front chauffeur's quarter, 35½ in.; depth of quarter panel over moulding and elbow, 9 in.; width of quarter on elbow line over moulding 22 in.; width of door, 22 in.; depth of ditto over all, 28 in.; depth of bottomside at door bottoms; 3½ in.; width of extreme front quarter 12 in.; across shield. 15 in.

Full length of canopy hood from body, 4 ft. 6½ in.; diameter of front horizontal slat from joint center, 30 in.; height of canopy from top of elbow, 28 in.; size of quarter sidelight, 23½ in. by 23½ in.; size of back light, 24 in. by 17 in.; depth of back panel over top moulding 24 in.

"LARGEST IN THE WORLD."

The Hayes Wheel Company, Jackson, Mich., will begin the erection of a new front along South Horton street, which will match the already fine building they now occupy. The new addition will increase the output, employ more men, and give the firm more room, a thing badly needed at the present time. The improvements are necessary because of the impossibility of getting out the orders for auto wheels of all kinds, and at present the orders are fully two months behind, while the men are working night and day on car wheels for the new 1912 models for touring cars, runabouts and heavy trucks. Usually the summer season is the slack time of the year, but a visit to the plant would make one think that if this is the slack season, what in the world would a busy season look like. The Hayes Wheel Company is the largest exclusive maker of wheels in the world, it is said, and turn out work for most of the best known auto makers of the country. Manager Morrey of the timber department has just returned from a trip to the South, where he has placed orders far in excess of any ever placed by a wheel company before.

MINNESOTA REQUIRES DATES ON TIRES.

Although it practically escaped the notice at the time of its passage by the legislature, there went into effect in Minnesota on August 1, a law which, more or less radically, affects all manufacturers of automobile tires by requiring that such tires shall be branded with the year of their manufacture. This novel law is as follows:

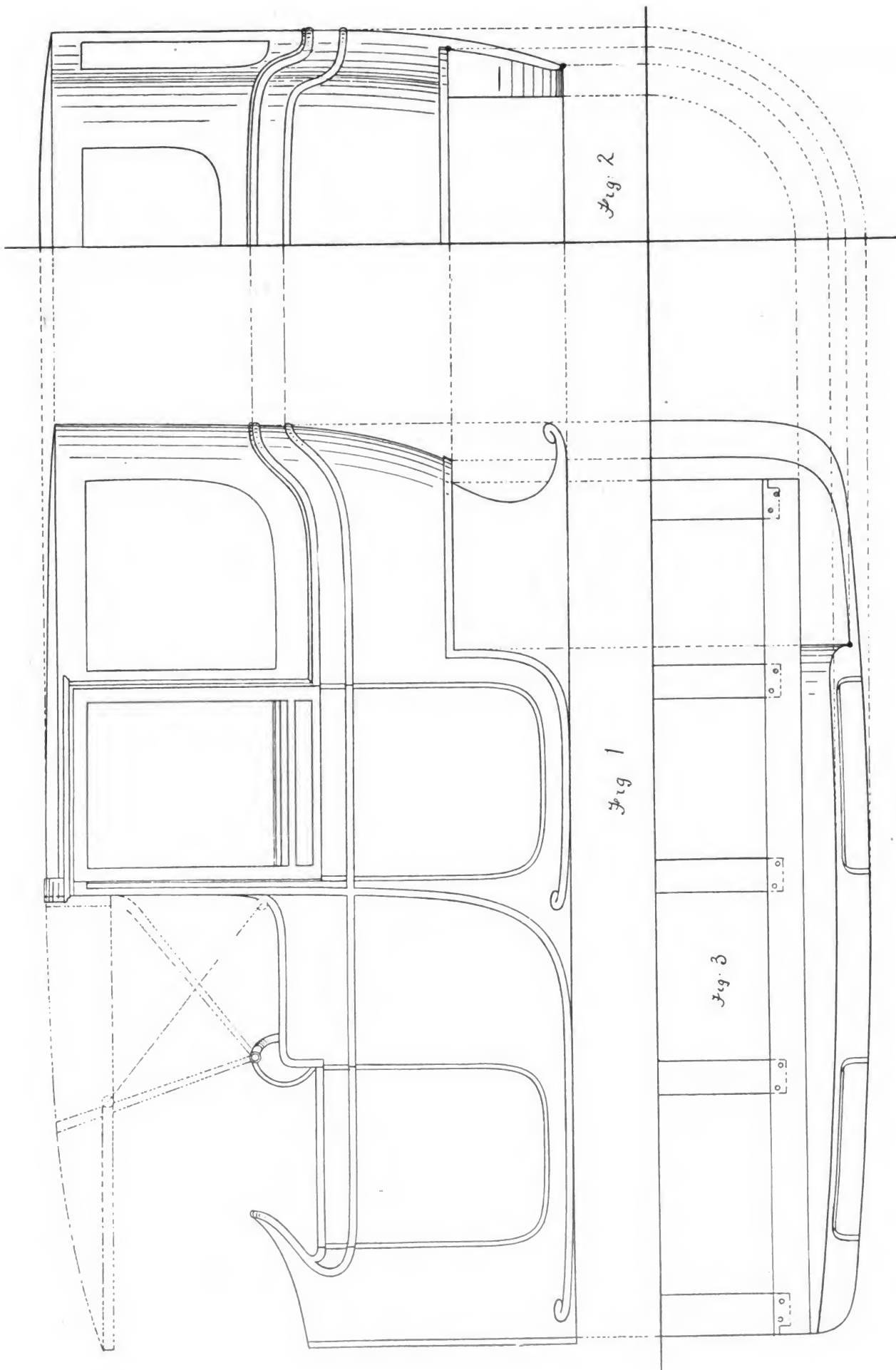
"No person shall sell any rubber tire or casing for use on motor vehicles unless the name of the manufacturer and the year in which the same was made are conspicuously and permanently marked thereon in raised type cast with the tire or casing."

The second section provides that a violation of the act makes the seller of such unbranded tires guilty of a misdemeanor.

Although all of the dealers and branch houses in the State had supplies of such unbranded tires in stock when the law went into effect, no effort has yet been made to hold them responsible for selling the goods.

CHANGE IN SHELDON AXLE CO.

F. L. Martin, who for the past 3 years has been secretary and sales manager for the Hartford Auto Parts Co., Hartford, Conn., has been made sales manager of the motor car axle department of the Sheldon Axle Co., Wilkes-Barre, Pa. W. J. Childs, the former sales manager, has resigned to become manager of the O. J. Childs Fire Extinguisher Co., Utica, N. Y.



HALF-HEADED LIMOUSINE BODY.
(Described on Foregoing Page.)

Carriage and Automobile Painting

ARABIC NUMERALS, INDEXES, ETC.

The letterer will find the Arabic numerals much more difficult than letters; and even the experienced men often fail to do themselves justice in this branch of their work. Not only are the forms of the numerals themselves less symmetrical than the letters, but the task of harmonizing them with juxtaposed letters often requires much skill.

We know of no better way to test the capabilities of a letterer, claiming to be a professional than to ask him to stretch out some such combination of letters and numerals as the celebrated formula: S T 1860 X. The test will be still severer, however, if we introduce a figure 7, which is the most difficult of all, owing to its entire lack of symmetry. This perplexing character, in fact, deserves to be denominated the shibboleth, or final test and criterion of the sign writer.

In the accompanying plate we give several groups of Arabic numerals which may be accepted as standards, and we recom-



Fig. 1.

mend that attention be given not only to forming each individual figure, but also to combining them tastefully with letters. Do not despair if you signally fail at first. Practice, together with a little taste, will conquer at last.

We should mention that all the numerals we now speak of are Arabic, although, in the vocabulary of the wagon and sign writer, the different styles take their titles from those of the alphabets with which they are intended to harmonize.

In Fig. 1 we show one of the many forms in which the character &, may be adapted to the needs of the wagon letterer. This is another of the difficult characters that he will often be called upon to introduce, and he will do well to collect numerous specimens that seem especially graceful, that he may make a selection when the demand arises, and choose such a form as will best harmonize with the style of lettering with which it is to be brought into juxtaposition.

In the single specimen here shown, which is a fancy style, the circle is about two-thirds of the height; the thickness, about two-ninths of the height; and the greatest width, about equal to the height. This is the Boston Roman form of this charac-



Fig. 2.



Fig. 3.



Fig. 4.

ter, and clearly indicates the Latin word *et*, meaning and, which is its origin. The left-hand side is the *e*, which it closely resembles; the right-hand side is the *t*, and, although it here resembles that letter but little, the character & of one hundred years ago had quite a perfect *t*. The present character is better adapted for ordinary use than the old fashioned, as may readily be seen by comparing this with one of the antique style.

The ampersand, which descriptive title of the character means simply: and per se, or, and by itself, will be found in constant demand in sign writing, and many of the alphabets shown in

full page plates have specimens specially adapted for harmonious use in connection with each. All of these deserved careful practice, both singly and together with letters.

Among the other arbitrary signs used in printing with which the wagon letterer will do well to acquaint himself are the following:

Fig. 2 represents the mark of interrogation, which is by no means easy to execute tastefully, and it therefore demands practice.

Fig. 3 is the exclamation point, which is perfectly simple to make.

Fig. 4 shows the dollar sign, the origin of which has been variously accounted for. Formerly it was customary to ex-

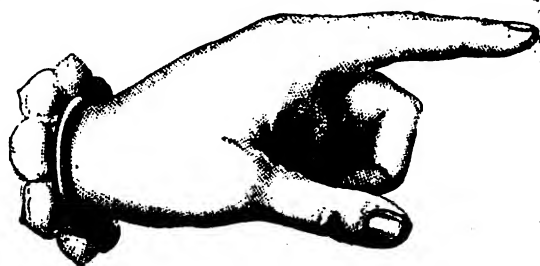


Fig. 5.

plain that it was merely a monogram in which the two letters U S were combined, but modern theory pronounces it a modification of the Arabic numeral 8, denoting a "piece of eight" (eight reals), a Spanish coin which was at one time the standard of value in the American colonies. In confirmation of this theory, it is alleged, on what seems good authority, that it was



Fig. 6.

in use previous to the adoption of the Federal currency, and consequently before the symbol U S had any significance.

We also add in Figs. 5 and 6 two indexes, or hands, with the index finger pointed, which will often be found useful by the wagon letterer and ornamentor.

As will be seen, we show both a right-hand and left-hand index; and, by tracing these and then carefully enlarging each in various sizes, they can be made to answer all ordinary uses.

HUMIDITY THE BANE OF THE CARRIAGE BUILDER.

Humidity is a sort of inanimate enemy of man and many of his products.

Its habitat is chiefly in the immediate vicinity of large bodies of water.

The vicinities of Portland, Boston, Providence, New Haven, Bridgeport, Charleston, Baltimore, Newark and New York are geographically and topographically well situated to encounter great volumes of humidity. All of them are at the sea level.

Where the factory buildings are wood or brick and there is

some vegetation and a quantity of vacant space, etc., humidity is insinuating.

If a gallon of water be thrown on a brick wall or a board fence not more than five per cent would be absorbed. If the same subjects are exposed to the atmosphere of which the humidity is 80°, it is very possible that in a few hours the subjects will have absorbed 50 per cent or more.

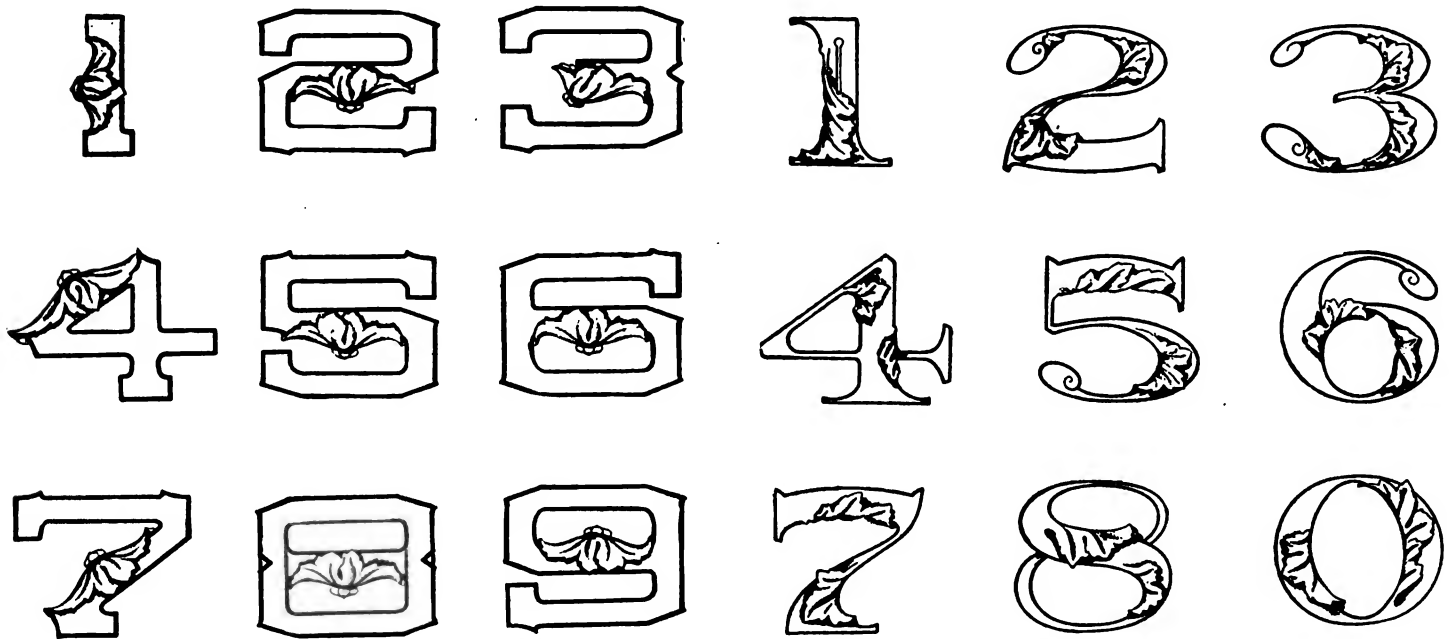
The average reader may not be prepared to accept this statement, which may be verified by examples. The Atlantic Ocean pours its waters through the Straits of Gibraltar at the rate of from three to ten miles per hour constantly into the Mediterranean Sea. What becomes of the vast volume of water which enters this great sea? To its south is the great sun-parched

Desert of Sahara, which is constantly heating vast volumes of air and sending the same over the Mediterranean and in so doing absorbing the moisture from the sea in vast volumes and sends it over Europe to be condensed into rain.

A certain amount of humidity is necessary in the atmosphere to keep up general existence. When humidity moves above 60° it enters everything possible to permeate. If it comes in contact with a substance which it cannot enter it condenses on the surface of the substance. Iron is an apt condenser, painted or unpainted. An iron pipe through which cold water is passing is the most competent condenser extant.

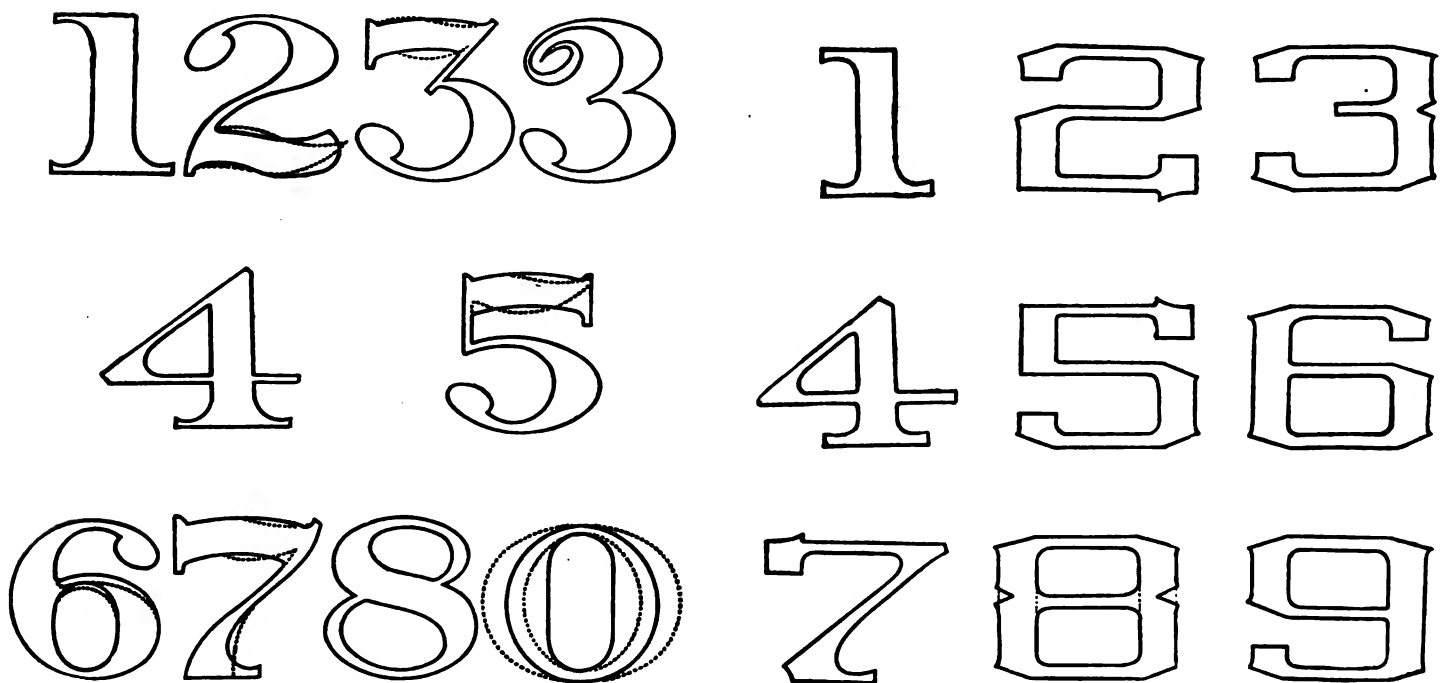
A woodworker may have finished a dozen whitewood panels at night-quitting time and have it all ready for gluing in the morn-

ARABIC NUMERALS.
(Described on Foregoing Page.)



EXTENDED FULL-BLOCK OCTAGON.

COMBINATION ROMAN.



NEW YORK ROMAN.

OMNIBUS ROMAN.

ing. If humidity comes along and loads the panels with water, it is wet from absorption and ought not to be used until it is thoroughly dry.

A panel is varnished just before nightfall. The heat begins to die out of the varnish room. The iron in the vehicle and other parts begin a general but light condensation. Wherever a drop is formed if it can or has reached 100° it drops on the panel or most any other place on the varnished part, no matter where; the varnish has just begun to set when along comes the drop of water and shuts off a good job at that point.

The cloth used in the trimming becomes a sponge and absorbs the water as soon as it is formed. If the humidity becomes 90° to 98° water may be wrung out of the cloth. The wet cloth picks up all the dirt possible, which, when dry, covers the cloth to look as though Joseph had ordered it for a coat to wear in the presence of Pharaoh.

When the humidity reaches 100° the atmosphere is as a cloud. The least shock or change in temperature will cause precipitation. It is safe to say that many thousands of dollars in losses may be attributed to humidity by the vehicle builder.

The philosophy of the drying kiln is about the only solution of the humidity question. Condensing pipes through which cold water is continually passing at convenient positions to attract humid atmosphere pull the water out of and let it trickle down the pipe and out into the atmosphere, thereby leaving a dry atmosphere in the building.

INDIAN TURPENTINE.

Indian turpentine from the forests at Naini Tal, was prepared at the government turpentine-oil distillery, it being desired to ascertain its value as compared with the turpentine oils of commerce. As the result of examination it was found that the samples closely resembled Russian turpentine oil, but the Russian product is very variable in composition, and in this respect the Indian oil would have an advantage. Samples were submitted to importers and varnish makers. The importers stated that the odor of the oil differed from that of American turpentine oil, and that an expert to whom they submitted it without stating its origin considered it to be a mixture of French and Russian oils. The varnish makers reported that the oil resembled Russian turpentine, and would have a similar value—i.e., about half that of American oil.

PAINT ROOM TOPICS.

Whenever a man has to work in a dust-laden atmosphere, he should wear a respirator, an apparatus covering and fitting tightly round the mouth and nose. If a man is only exposed to the dust for a few minutes at rare intervals, a damp cloth tied tightly round the face is a very good safeguard; but it must be thoroughly washed before being used a second time. All painters, as a precaution, should grow beards, and especially moustaches; the latter, when heavy and full, protect the nose and mouth. The little hairs at the base of the nostrils should never be cut, but encouraged to grow across the orifices, as they naturally do if not interfered with.

A hat or cap covering the hair of the head should always be worn when at work, and removed at meal time. Before a meal the hands and face should be washed in plenty of water, particular care being devoted to the moustache and beard; for if the hair on the face is employed (as it should be) to strain out the dust, it is evidently absurd to put food into the mouth or drink through the dirty hair. One very dangerous habit indulged in by many men working with lead or other poisonous substances—and this applies to painters—consists in chewing tobacco during working hours. Many men are very careless in other respects; they acquire the habits of picking their teeth with a dirty pocket knife, or scratching their heads or skin, rubbing their eyes, sometimes of putting their fingers into their nostrils when their hands are dirty; and these practices are es-

pecially reprehensible, because the edges of the nails are sharp and cut the skin, while underneath the nail a lot of dirt always collects. Workmen are very inattentive to cuts, scratches, and sores on their hands. Whenever the skin is broken, the wound ought to be washed immediately, the place tied up tightly with clean rags, and kept protected from the air and dust until the new skin has grown.

Cleanliness means that we must utilize all the methods which nature has given us for keeping dirt at a distance; that we must breathe through our nose and moustache, that we must not be careless about cutting and bruising our hands. Cleanliness means that as we have used our moustache to strain out a poisonous fume from the air, so we must wash it before every meal or drink, and that we must equally wash our hands before touching food. Cleanliness means that we must not smoke or chew old paint skins under the name of tobacco, nor such a pipe half full of white lead.

If these rules are rigidly adhered to—every day and all day long—no man handling only ground lead compounds, i.e., no painter, need every fear plumbism; and when such a one does succumb to lead poisoning, it is emphatically his own fault.

Some of the antidotes to lead poisoning may be described. Milk is useful, but the best substance to drink is sulphuric acid lemonade or sulphate of magnesia lemonade. Lead sulphate is practically insoluble in the body, and it is therefore almost, if not quite, harmless. Any substance which will change white lead into sulphate of lead is thus an antidote, and will neutralize the effects of lead fumes, or any other form of the poison. Sulphuric acid lemonade must not be looked upon as a medicine, although it behaves as such; it is really nothing but ordinary lemonade which derives its pleasant sour taste from the presence of a very small quantity of dilute sulphuric acid instead of anything else, and nobody can tell the difference between it and any other variety of lemonade. It has one slight objection, however; sulphuric acid is somewhat constipating in its action, and its constant use may accordingly derange the bowels. To overcome this defect a lemonade containing a small quantity of sulphate of magnesia, or Epsom salts, which, as everybody knows are aperient, is good. Even here the taste is not bad, for the salts are masked by the lemon or other flavoring. The commonest effect of lead poisoning is to produce painter's colic, which is attended by obstinate chronic constipation, and sulphate of magnesia is one of the best drugs to combat this trouble.

All men employed in any manufacturing operation, should regard the substances they handle as prejudicial to health, and as demanding, therefore, every care and precaution in their manipulation. It is a great mistake to think that only those articles which the druggist calls poisons are really dangerous; it is very much better to assume that everything which is not fit to be eaten or drunk is more or less of a poison. Among the substances which are often regarded with indifference are dusts of all kinds. People who are delicate at the chest are greatly inconvenienced by inhaling any fine powder, the dust of streets, flour, and, in particular, the sawdust of hardwoods. Any of these powders is liable to increase an inherent tendency to bronchitis, all of them will bring on an attack in an asthmatic person, while some of them are exceedingly and permanently deleterious in the air passages.

SPLIT PANELS.

By J. F. Montague.

In the factory in which I am employed a difference of opinion exists regarding the use of "Dutchmen" in carriage body panels.

The writer, who has charge of the painting department, contends that this use is confined solely to that grade of work in which quality is not considered, or in factories which are not supplied with workmen who have had a practical training along

lines that teach the fundamental principles which underlie body building.

The carriage painter employed on fine carriages, either first class, medium grade or best custom work, will not permit a panel in which a crack has developed to pass through his hands after it has been treated by the sawing process and the introduction of a piece of wood to fill the slit.

He knows very well that it would be but the question of a short time after the vehicle would be put into service when the contraction and expansion of the panel would soon expose the botched workmanship and register the quality and grade of the work his employees made.

There have been many time-saving devices introduced during the past twenty years, by which a first class medium grade carriage may be built without sacrificing the appearance or durability of the work, but in none of them has the "Dutchman" succeeded in making more than a one-night stand.

That insinuating gentleman from the misty banks of the Zuyder Zee lost caste among builders of decent carriages over a hundred years ago, and despite the attempts to popularize his use by those who have failed to learn by the experience of others he is still an impossible proposition when decent, honest work is in demand.

It is too bad that in this day of doing things in large quantities at a popular price that workmen do not read more of that kind of literature which gives best methods for performing their tasks.

If they did, there would be less loss in every line of work, and instead of the ninety per cent of manufacturers whom statistics show fail annually in the United States, many would escape the scrap pile, for there are certain fundamental principles underlying each process that enters the making of goods which cannot be ignored without adding considerably to the cost, and many of these principles were discovered and applied long before we were born.

Manufacturers will continue to be flim-flammed and the carriage trade will furnish its quota of victims.

PAINTING ON ALUMINUM.

There should be no difficulty in finishing a motor body with aluminum, and to get a satisfactory result it would be necessary to have the car prepared exactly the same way as though it were going to be painted; that is to say, it should be coated with lead color, filled up and rubbed down, brought up in light lead color, then coated with two coats of aluminum paint, which should be made from aluminum powder, and a special medium to be mixed at the time of application.

VARNISH FOR BRASSWORK.

To lacquer brass work on a car, first rub the metal with a weak solution of vinegar and salt water till every bit of foreign matter is removed. Next wash with warm water and soap and polish with a dry cloth. The lacquer now applied will slightly darken the color of the brass.

SOUTHERN BUGGY MANUFACTURERS' ASSOCIATION.

The Southern Buggy and Wagon Builders' Association held a meeting July 12 at Old Point Comfort, Va., and changed its name to Southern Buggy Manufacturers' Association. A code of by-laws was adopted and a permanent organization effected, with officers as follows: President, R. S. Barbour, South Boston, Va.; first vice-president, E. B. Ballou, Oxford, N. C.; second vice-president, W. T. Minor, Durham, N. C.; secretary and treasurer, H. A. White, High Point, N. C. At this meeting was launched a movement to create a central office with a competent general secretary in charge, who shall give his entire time to the interests of the buggy and wagon builders of the South. The date of the annual meeting was set for Wednesday after the second Monday in July of each year.

THE EXPANSION OF RUBBER.

The demand for raw rubber has had a wonderfully stimulating effect on its production. Its culture seems to be undertaken in almost every part of the globe.

The original para sources are quite dismayed, we would judge from what we read, and think of limiting the output in order to decrease the supply. As the Brazilian "valorized" coffee, so they now talk of the valorizing of rubber.

Up to the present time the United States has not been a rubber grower, but it seems that the Philippine possessions (if we can call them the United States) have been found to be well adapted to rubber production, and it is proposed to exploit them in that direction.

Fifty million acres suitable for rubber growing are ready for the planter. There is no hard and fast rubber belt, for it is conceded that almost the whole extent of the Philippines has climatic and soil conditions suitable for rubber. Trees grow in Manila with the same luxuriance that they show in Mindanao and the islands of the Sulu Sea. Rubber is being grown in Singalong Experiment Station in Manila, and across Manila Bay in Bataan province is the Abucay Rubber Plantation, where two-year-old trees are now twenty feet high. In the Island of Basilan are the Basilan Rubber Plantation Company which is harvesting rubber and the San Rafael, whose trees are making a record for growth.

From Manila to Basilan is 600 miles in a direct line and it is absolutely proven that all this area at least is rubber land since rubber is grown at its extremities.

Rubber is not exclusively a rich man's game, for the poor man cannot find a better proposition for future income than this and he can make a living off his land while his rubber is growing. Malaysia proves this for 40,000 small farmers are there listed as having from 10 to 1,000 trees each, and with the rubber tree as with the cow, the man with one makes profit as well as the man with the herd.

In Mindanao the Basilan Rubber Plantation Company has produced and exported crude rubber for two years. The San Rafael Plantation Company has 20,000 rubber trees, some of them large enough to tap, but they are so busy planting that they are leaving the tapping for a time. Near Neuva Caceres in Ambos Camarines Province, Mr. R. Richmond has a Para rubber plantation of 10,000 trees, three years old, that are doing fine. The Abucay Rubber Plantation Company near Abucay, Bataan Province, have 40,000 Para rubber trees about a year old and they are making arrangements to plant 100,000 more from the nursery next year. The Lapac Plantation Company, on one of the southern islands near Jolo, has a hopeful growth of rubber trees nearly ready to tap. There are also others who are planting rubber.

Several of the above companies have begun to tap their trees and the Basilan company is exporting rubber. This leaves no doubt but that the Philippine Islands are adapted to rubber growing and some day there will be a greater interest taken in supplying our share of the American demand.

RATE REDUCTION.

The Interstate Commerce Commission has handed down a decision ordering the Chicago, Milwaukee & St. Paul Railway Co. to reduce its rate on carload shipments of automobile parts from \$3 per hundred pounds to \$1.90 between Milwaukee and Los Angeles, the language of the decision being such that although only these points are immediately affected, it justifies the belief that a general reduction in the rate on such shipments is easily possible if the effort to obtain it is made.

THE COWLES CATALOGUE.

C. Cowles & Co. has issued a very interesting supplement (No. 2) to their very fine lamp and trimmings catalogue, containing many new designs.



MEET ME IN ATLANTIC CITY IN SEPTEMBER.

The Carriage Builders' National Convention is the Alluring Prospect. Make a Note of the Date, September 25-28.

MILLIONTH PATENT JUST ISSUED TO OHIO INVENTOR.

Announcement of the issue of the millionth patent (since they have been serially numbered) was announced August 5 by Commissioner Edward B. Moore. It was issued to an Akron, O., man, Mr. Hilton, for a puncture-proof tire for automobile and other vehicles, depending upon rubber springs for its resiliency.

Commissioner Moore said the application came up in the regular order of business, was numbered, and carried through the regular channels, and was signed without ceremony. Numerous requests were received from various inventors for this distinction, but they were not heeded.

This patent, although numbered 1,000,000 is not the millionth, for the reason that prior to July 28, 1836, there were granted 9,957 patents without numbers. So that counting from the first patent granted, July 31, 1790, and including the 9,957 unnumbered patents, the millionth patent would be the one now numbered 990,043, issued April 18, 1911. The first one was granted to Clarence Thorwald Hasen of Lancaster, England, for a machine to make tubes from fibrous materials.

The American patent system was founded by an act of Congress April 10, 1790. Thomas Jefferson, then Secretary of State, inspired it, and may be said to have been its father. He took great pride in it, it is said, and gave personal consideration to every application that was made for a patent during the years between 1790 and 1793.

Under this act applications for patents were examined by a board of commissioners consisting of the Secretary of State, the Secretary of War and the Attorney-General, and, after having been passed upon by this tribunal, they still required the certificate of the Attorney-General and the signature of the President. The first board consisted of Thomas Jefferson, Secretary of State; Henry Knox, Secretary of War, and Edmund Randolph of Virginia, Attorney-General. The first patent was granted to Samuel Hopkins on July 31, 1790, for manufacturing potash and pearlash.

The Act of 1790 prescribed the following fees for the granting of patents, which are in striking contrast with those exacted to-day: "For receiving and filing the petition, 50 cents; for filing specifications, per copy sheet, containing one hundred words, 10 cents; for making out the patent, \$2; for affixing the great seal, \$1; for indorsing the day of delivering the same to the patentee, including all intermediate services, 10 cents." To-day the government fees amount to \$35.

In 1793 the patent laws were revised and from that time until 1836 no system was maintained and every application that was made was granted. In 1836 Congress passed new laws that are the foundation of the present patent laws. It was in this year that patents were first numbered, July 28, 1836. Patent No. 1 was granted to John Ruggles, of Thomaston, Me., for a locomotive steam engine for inclined planes. Since that time, 1,825,000 applications have been made, of which 1,000,000 have been granted. There are 90,000 pending; the rest are abandoned. These represent an approximate expenditure of \$47,000,000 in government fees from the inventors alone.

Under these laws (Act of 1793) the Board of Commissioners was abolished and the power to grant patents was vested in the Secretary of State. It was not until 1836 that the office of Commissioner of Patents was established. Henry L. Ellsworth was the incumbent.

America leads the world as an inventive nation, France coming next, with 445,000 patents; then Great Britain, with 430,000; Germany, with 250,000; Belgium, 240,000; Canada, 135,000. The Bahamas and Liberia share the "booby" prize with two patents each. The total number of patents granted by all nations of the world is 3,150,000, of which 30 per cent. have been granted by the United States.

The patent Office is now granting patents at the rate of 35,000 a year, applications being received at the rate of 65,000 per annum, the examination of which requires 375 examiners.

Owing to the enormous increase in the business of the Patent Office in the last few years, its building has become very much overcrowded, and Commissioner Moore hopes that Congress will appropriate the \$7,000,000 now in the Treasury to the credit of the Patent Office for a new building.

MINIMUM WEIGHT PROTEST.

Manufacturers of agricultural implements and vehicles throughout the country are wrought up over a proposed change by railroads operating in western territory in minimum weights on car load shipments, and it is expected that existing differences eventually will be placed before the Interstate Commerce Commission for adjustment.

The minimum named by the carriers at present in order to obtain a car load rating on agricultural implements and vehicles is 20,000 pounds, and a plan is now before the meeting of the western classification committee in Milwaukee to change that figure to 24,000 pounds for a car thirty-six feet long. The new arrangement also provides that for forty-foot cars the minimum shall be 26,880 pounds, for forty-four-foot cars 29,760 pounds, and for fifty-foot cars 34,080 pounds.

It is pointed out that manufacturers of agricultural implements and vehicles now have thousands of orders based on a 20,000 minimum for car load rating, and the proposed alteration, it is declared, would lead to much inconvenience and expense.

It is contended by the railroads that the effect of the proposed changes practically will be nullified by special rates that have been granted.

Shippers, however, say that it has been the custom of the railroads in the past to cancel these special rates as soon as changes have been made in minimum weights, and that they have reason to believe that such a course will be pursued in the present instance. In that case, it is asserted, it will be necessary for the shippers to ask the Interstate Commerce Commission to intervene.

Shippers generally, it is said, are displeased because of the refusal of the western classification committee to postpone consideration of changes recommended by the uniform classification committee.

GERMANY'S NEW PATENT LAW.

In place of Article 11 of the Patent Law of April, 1891, Germany's amending Act provides that "should a patentee refuse permission to an applicant for the use of the invention in return for reasonable compensation and guarantees the right to use the invention may, if the grant of such permission is required in the public interest, be given to the applicant on a compulsory license. The right may be given in a limited form and made dependent upon conditions. The patent may be revoked, in the absence of international agreements to the contrary effect, if the invention be worked exclusively or mainly outside the German Empire or the protected territories. The transfer of the patent to another is without effect in so far as the sole object is to avoid revocation. No decision shall be come to against a patentee under the above provisions until after three years from the notification of the grant of the patent." This law is now in force.

NEW FACTORY AT NELSON.

Ground has been broken at Nelson, Neb., for the erection of an automobile factory. The building will be of concrete blocks and will be 70x100 feet on the ground, supplied with the best and most up-to-date machinery that can be procured. It is financed by local capitalists, who bought a controlling interest in the Argus Automobile Company, and have moved it there, where there are better shipping facilities and the company can better procure labor. The Nelson Commercial Club and the citizens of Nelson made a donation of about \$2,000 to the company as an aid in their moving.

What Motor Inventors Are Doing.

Quest For Silence In Devious Ways.

When the sleeve type of motor was first presented to the notice of the builders of automobiles it fell upon deaf ears. It was not then supposed that a machine could be so built that it would perform silently, and in all fairness noise was courted on the ground that it was a good indication of a vigorous power plant. As time settled upon the ability of power plants in general, it was learned that noise was not necessarily an indication of power—in fine when efficiency became a factor in the enterprise and the twins of merit were looked upon as the progeny of silence and efficiency—the desire to get away from the cause of noise and power losses took root in the thoughts of designers; the automobile industry has so far progressed that the supporters of the industry are putting a premium on silence, and it would be difficult to disabuse them of the idea that where silence reigns efficiency is absent.

It would be difficult to state how many of the makers of automobiles of to-day are working upon the various types of motors that do not depend upon poppet valves for their performance. Moreover, it may be truly stated that every maker of cars who puts faith in poppet valve mechanisms is re-designing the parts on a basis of silence as the prime consideration, and it is doubtless true that when the valves do their work noiselessly they function efficiently also. It is more than likely that the best testing instrument available to the mechanic may be known by the appellation of "kinetic silence," the attempt being made here to distinguish between the static and the kinetic condition, with the hope, perchance, that the silence of the machine as it rests in its motionless static state will be transferred to the time when the motor is doing kinetic work.

There are many schools of design in motor building, and the staunch advocates of the poppet valve type of motor are proving by their work that silent performance is no stranger to a well made poppet valve type of motor, nor is there any indication at the present time that these sturdy power equipments are to be supplanted by something new. It has been said in recounting business ventures in general that upwards of 94 per cent of all the efforts that are made end in failure, and that a sparse 6 per cent of industrial activity ends in success. Of the many undertakings in the motor field that have for their foundation the building of something new, it is not too much to expect that the customary percentage of the whole effort will go down in history on the carry-all of failure, and it is the purpose in this presentation, says *The Automobile*, (to whom we are also indebted for the illustrations), to save time and the sap of investment by telling the various designers of the efforts that are being made in this field avoiding, in so far as it is possible to do so, the praising of individual undertakings until it can be shown by actual trial that they will survive the "acid" test.

How Designers Approach the Problem of Motor Building.

Before passing on to the discussion of the types of motors that differ in principle from the Knight design, it is proposed

to show by illustration and reference the modifications of this idea as they obtain in Continental makes of motors and Fig. B is an elevation in part section of the Panhard-Knight motor as made by Panhard & Levassor, Paris. In this elevation, which is of the left-hand side of the motor, the front cylinder is given in section, showing the main bearings M1 and M2, the part of the middle main bearing M3, the latter being provided with means for taking the thrust imposed upon the crankshaft. The connecting rod C1 has a liberal size of large end bearing M4, and the piston H has three rings h above the gudgeon pin. Attention is called to the inverted sphere-like head of the piston, and the fact that one of the piston rings h is in the body of metal forming the wall of the piston above the plane of the inverted sphere-like head. Among other possibilities it is more than likely that the designer of this motor figured upon the insulating quality of a layer of dead gas in the cup formed in the piston head, but this depression is also indicated by the necessities of a proper compression ratio dictated by the fact that the cylinder head inserts into the cylinder and a considerable amount of the diametrical space is occupied by the walls of the head, accommodating a junk ring e, not forgetting that the

sleeves are in concentric relation with the cylinder, also the piston, and the part of the head that extends down into the cylinder, so that the compression space E formed in the head would scarcely suffice in view of the requirement, and it therefore follows that the depression of the piston head offers the advantage of regulating the compression ratio without the necessity of exposing the walls of the sleeves to the flame during the

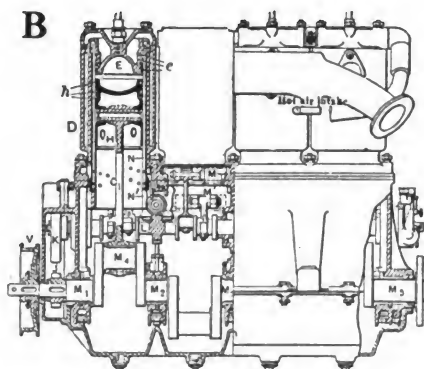


Fig. B—Sectional view of the Panhard-Knight motor, showing the relation of the sleeves, the spherical piston, and the method of operating sleeves.

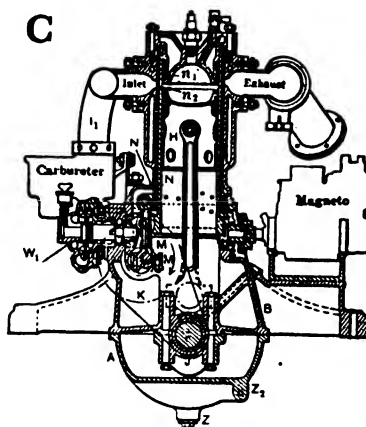


Fig. C—Transverse section of the Panhard-Knight motor, showing the small connecting rods that operate the sleeves and the cup-shaped piston.

period of combustion. We do not call to mind that anyone has heretofore pointed out that the sleeves of the Knight motor are protected from the fierce glare of the flame during the period of combustion. In this particular design of motor a single spark plug is inserted in the axis of the head, but the provision for cooling in the region of the spark plug is on a liberal basis.

The eccentric shaft L takes its power from the crankshaft through the pinion B by means of a silent chain to the gear K. The sleeves N and N' have motion imparted to them through the connecting rods M and M'. The shrouded pulley V on the end of the crankshaft takes a belt for use in driving the air propeller. The crankshaft is flanged at the rear end and the main bearing M5 is of unusual length and has a liberal projected area.

Referring to Fig. C of the Panhard-Knight motor, the contour of the inlet and exhaust ports is sweeping and smooth, terminating in symmetrical lips of the inlet and exhaust ports, and when the piston H is on the top dwell point, the space between the shell of the piston head and the innermost point of the cylinder head is barely sufficient to uncover the slots in the sleeves, and the packing rings n1 and n2 on the inlet side, co-operating with the slots in the region of the exhaust port, imprison the mixture under compression within right confines, and leakage is substantially avoided. In examining this section of

the cylinder in the region of the lips of the ports we do not find the same careful attempt to maintain cool conditions is as evident in some other examples of this same make of motor, although the excess of metal forming the lips of the ports is in close relation to the water in the jacket, difference being due to the extension of the lips for an unwatered distance, and the bunching of metal, due to fillets, that must obtain under foundry conditions in a design so made.

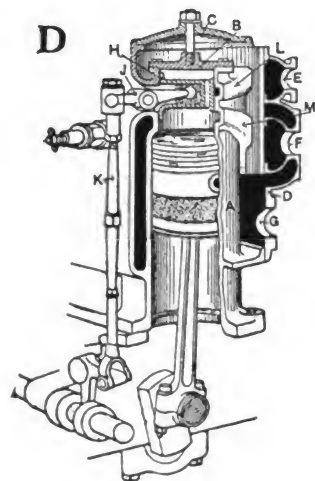


Fig. D—Showing the Reno Bois motor with part of the water jacket removed, together with the valve operating mechanism.

The carburetor is located on the right side of the motor and the intake I1 is of somewhat symmetrical design, with an upward trend for a material distance before it branches out through the distributing arms to the respective cylinders. The magneto is on the opposite side of the motor, taking its drive from a cross shaft, the latter being driven through the good office of a spiral gear located between the first and second cylinders on the eccentric shaft.

The water pump W1 is shown in section on the right-hand side of the motor and is driven by an extension of the cross shaft in the plane of the magneto drive; an Oldham joint is placed in the length of this shaft at the approach of the water pump. Referring to the joint in the shaft as it extends to the magneto, it is of the dog type, and the magneto resting on a ledge extending out from the crankcase may be unbolted and removed at will without having to undo the joint, thus making for easy examination and repair.

How the Reno Bois Place the Sleeves in the Cylinder Head.

Fig. D, which is a part section through the cylinder of the Reno motor, is a clear presentation of the idea instilled in this design, showing the crankshaft in the crankcase in the customary way and the connecting rod joining the crankpin to the piston through the gudgeon in the regular way, the valve mechanism being placed in the cylinder head, which by letter reference is described thus: The valve gear consists of a split ring H fitting closely in the cylinder head and provided with a bearing block which is engaged by the rocking lever J, which in turn is operated by the tappet K. This tappet is raised and lowered by means of a short bell crank, one leg of which engages the tappet, and the other a double-faced or channelled cam carried on a camshaft parallel with the crankshaft.

To allow the rocking lever J to pass into the cylinder a slot is provided in the latter, which is always covered by an extension of the ring valves whatever the valve position. The split ring valve in its travel moves over the annular chambers L and M which are cast in the cylinder wall and form the inlet and exhaust ports respectively, these ports being in communication with the inlet or exhaust trunks E and F.

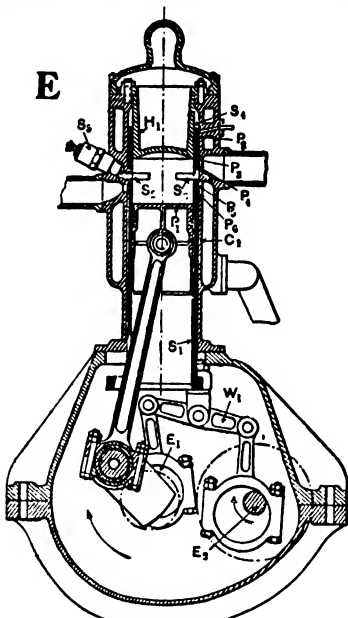


Fig. E—Transverse section of the Rolland & Pillain motor, showing the method of operating the single sleeve and the location of the spark plugs.

The diagrams (a), (b), (c) and (d) in Fig. G show the valve in the induction, compression, firing and exhaust positions, the inlet port E (Fig. D) and the exhaust port F being shown uncovered during the induction and exhaust strokes, and both

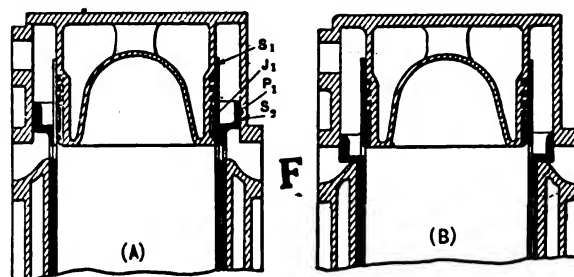


Fig. F—A shows section of motor with sleeves open. B position of outer sleeve when valves are closed.

covered during the compression and working strokes. A (Fig. D) is the cylinder casting with a detachable head B, the central bolt of which holds the water jacket cover C. The side plate D carries the inlet union and chest E, and the exhaust trunk and union F, also the water connection G. The report of the performance of a motor of this design with a bore of 85 millimeters and a stroke of 130 millimeters states that the motor delivers 28 horsepower at 1,350 revolutions per minute, and it has been stated that this is the speed of greatest stability, although the motor accelerated during the test up to 2,200 revolutions per minute.

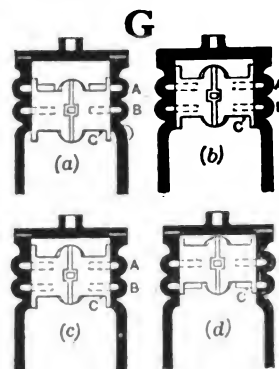


Fig. G—Section of the Reno slide valve engine showing induction, compression, firing and exhaust strokes respectively.

Rolland & Pillain Single Sleeve Motor. A motor that performed favorably under racing conditions in France within the last two or three months, the Rolland & Pillain, is shown in Fig. E with the sleeve S1 concentrically related to the cylinder C1 and the piston P1 with slots S2 and S3 in the sleeve and a depressed head H1, leaving a space S4 between the cylinder wall and the head to accommodate the sleeve in its reciprocating relation, with packing rings P2, P3, P4, P5 and P6, in the sleeve to maintain good compression, and the spark plug S5 so located that firing must take place during the period of uncovering due to the slot in the sleeve, shutting off the spark when the port closes. The sleeve S1 is given reciprocating motion by the walking beam W1, which is actuated through a combined effort of the eccentric E1 on the crankshaft and the eccentric E2 on the half-time eccentric shaft. The water-jacketing of the motor has been done with care, and the general design shows the earmarks of a motor engineer.

Knight Makes Modification of His Main Type of Motor.

In Der Motorwagen of November 30, 1910, there was a description of the modified forms of sleeves as shown in Fig. S at A and B. Referring to A the ring.

junk ring J1 aided by the three rings above are placed to maintain the tight relation of the long sleeve S1. The short sleeve S2 is so fashioned as to press against the outer wall in the cylinder head above the ports and a packing ring P1 is placed in

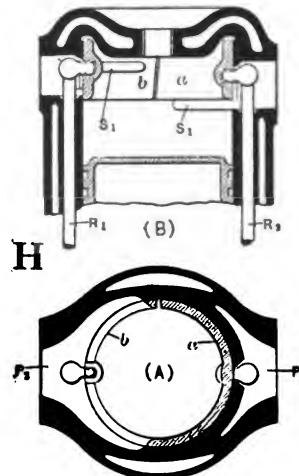


Fig. H—Sectional view of the Howard sliding sleeve valve motor utilizing a spherical split ring.

the enlarged diameter of the ring to prevent the leakage of compression. In B (Fig. F) the outer ring is in the down position covering the ports.

Showing the Construction of the Howard Motor.

In the Howard motor, which is given in sections A and B, Fig. H the crankshaft, connecting rods and pistons conform to the conventions. The valve mechanism is composed of horse-shoe-like members *a* and *b* in the head above the piston on the top of the stroke, with slots *S1* and *S2*, which are covered and uncovered according to the four-cycle principle, and a reciprocating motion, that is required for the purpose is imparted to the covers by means of the rods *R1* and *R2*, as shown in the section B.

Referring to the section A through the cylinder and valve

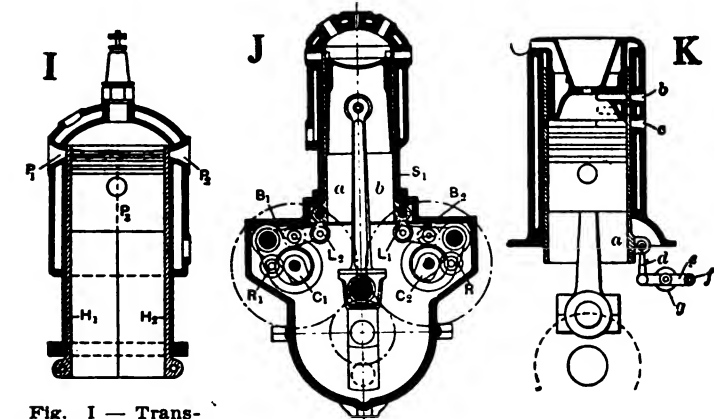


Fig. I—Transverse sectional view of the Redrup motor in which two hemispherical sleeves cover and uncover the valve ports.

Fig. J—Transverse section of the Mustard motor, showing how the two hemispherical sleeves are operated by means of cams and rollers.

Fig. K—Section of the Moore motor, using single sleeve, with slots one above the other.

covers, the cover *a* is over the Port *P1*, but the cover *d* is in the position of "open," permitting the flow of gas from port *P2*. A further examination of this type of valve mechanism places it in the class with the Reno motor, and the sliding members forming the valves are held to their seats by pressure.

Referring to the Redrup Type of Sleeve Motor.

Fig. 1 is a section through a cylinder of the Redrup type of sleeve motor showing a single sleeve between the piston and the bore of the cylinder, the main difference being that the sleeve is in two halves *H1* and *H2*, split through the diameter as indicated by the line *a*, and the two halves of the sleeve are given reciprocating motion to cover and uncover the ports in

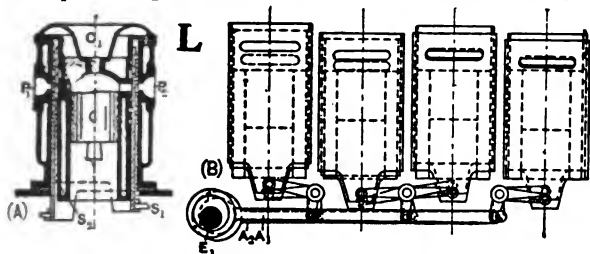


Fig. L—A, sectional view of the Riley sleeve motor. B, valve operating mechanism of the motor showing the relation of the ports in the sleeves.

the four-cycle timing relation. In the patent specifications of this motor the sleeve members are described as follows: "Consisting of a tapered sleeve split in halves lengthwise and fitted inside a cylinder which has one end closed to form the combustion chamber. The slides are at the inner end of their travel (as shown) so as to cover the ports *B1* and *B2*; the slides would remain in this position during the compression and power stroke of the piston *P3*, which reciprocates within the parallel bore of the sleeves *H1* and *H2*. Owing to the outside of the sleeves and the inside of the cylinder being slightly tapered, when the slides are in the position shown, pressure will be exerted on their meeting faces along two directly opposite division

lines, thus making these two joints tight, and also making a tight joint by each sleeve over the two ports, and also between the sides of the slides and the piston. The inner ends of the slides are their thin ends, and the outer ends are the thick ends,

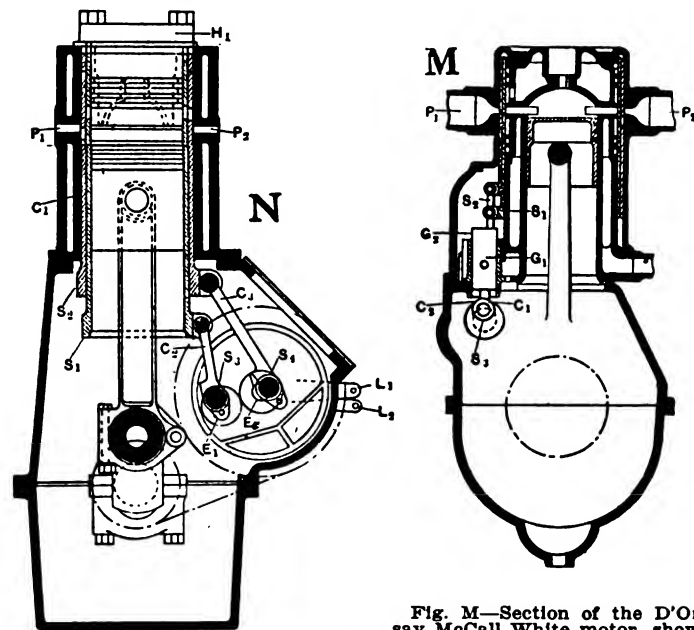


Fig. N—Sectional view of the Lanchester double sleeve motor, showing method of operating the sleeves by epicyclic gearing.

Fig. M—Section of the D'Orsay McCall White motor, showing the stationary valve guide situated inside and endwise movable tubular distribution valve.

while the bore of the cylinder is smaller at the inner end and larger at the outer end." The invention provides for the linking up of the slides in any suitable way.

O. Mustard Comes Out With a Modification of the Idea Described in Fig. J.

During the last Paris Salon interest was taken in the design of motor as shown in Fig. J, which is a section through the same, presenting a sleeve *S1* in the bore of the cylinder accommodating the piston, the sleeve being in two halves *a* and *b*, split longitudinally. Motion is imparted independently to the respective halves of the sleeve to give the four-cycle timing. This sleeve motion is induced by cams *C1* and *C2* on opposite sides of the crankshaft and is interpreted by rollers *R1* and *R2* through a bell crank *B1* and *B2*, thence to linkages *L1* and *L2*. The camshafts are in the halftime relation with the crank shaft.

W. W. Moore Resorts to the Use of a Single Sleeve.

Referring to Fig. K, showing a cross section of a cylinder of a motor, the single sleeve *A* is in the concentric relation with the piston in the bore of the cylinder, and ports *b* and *c* are uncovered according to the four-cycle principle of timing, reciprocating motion being given to the sleeve through the links *d* interpreted by the lever *e* with a fulcrum at *f* and a cam motion *g*. In other respects this type of motor conforms to the main idea of sleeve design.

Chalmers Takes Kindly to the Two-Sleeve Idea.

Fig. Q presents a Chalmers motor of the double sleeve type in part section, the sleeves being of different lengths with a long sleeve *L1* within a short sleeve *S1* between the long sleeve and the bore of cylinder *B1*. Motion is imparted to the sleeves through the link *L2* for the long sleeve, and the link *L3* for the short sleeve from an eccentric *E1*, taking rotary motion from

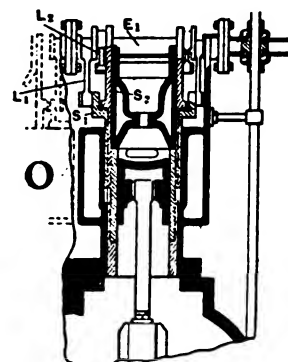


Fig. O—Longitudinal sectional view of the McIntosh motor in which the two sleeves are operated from an overhead eccentric shaft.

the crankshaft S2, the speed of the eccentric being half of the speed of the crankshaft. A is the inlet port and B2 is the exhaust port. The invention has been described as consisting in supplying air under pressure for scavenging and adding to the inlet charge. The air is admitted into the crank chamber by the passage C1, and compressed on the down stroke of the piston. The compressed air then finds its way by the passage D1 through the port E2 which at the right time registers with the port F1. In this way the air compressed in the crank chamber is allowed to enter the cylinder twice during each cycle. This occurs at the end of the suction stroke after the inlet valve is closed. Thus the gas in the cylinder is added to by the amount of compressed charge supplied, and to compensate for the dilution the gas taken through the inlet port A is richer than usual. On the exhaust stroke fresh air is again admitted under pressure, affecting the scavenging action.

D'Orsay McCall White Type of Motor.

This motor is of the double sleeve type, but instead of placing the sleeves within the bore of the cylinder in the concentric relation with the piston, they are placed between the outer wall of the water jacket and a projecting exterior sheath. The sleeve S1 is given reciprocating motion through the connecting rod C1, assisted by a guide G1, and the sleeve S2 is reciprocated by the connecting rod C2 through a companion guide G2. The connecting rods have motion imparted to them by eccentrics on the shaft S3. This shaft is driven through a train of gears by the crankshaft in the usual way. Gas is admitted through the port P1 and exhaust is out of the port P2. The slots in the sleeves register in a manner conforming to the four-cycle relation and leakage by the sleeves is prevented by rings in grooves suitably disposed in the exterior walls of the water jacket, assuring tightness under all conditions.

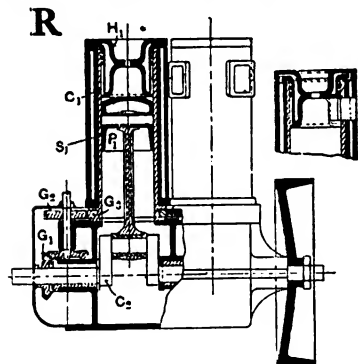


Fig. R—Longitudinal sectional view of Carroll rotary sleeve valve motor and section of cylinder showing how the ports are uncovered.

Lanchester Motor of the Two-Sleeve Type.
Referring to Fig. N of the Lanchester motor with two sleeves S1 adjacent to the piston in the concentric relation and S2 between S1 and the cylinder C1. The mode of operation imparting reciprocating motion to the sleeves is through a connecting rod C2 for the inner sleeve and another connecting rod C3 for the outer sleeve.

Reciprocating motion is imparted to the inner sleeve S1 through the connecting rod C2 by the eccentric E1 on the shaft S3, and motion is imparted to the sleeve S2 through the connecting rod C3 by the eccentric E2 on the shaft S4. The ports P1 and P2 are covered and uncovered according to the four-stroke cycle principle. The cylinder head H1 is water-jacketed and it is inserted into the bore of the cylinder which terminates in a spherical dome. The shaft S4 by which the outer sleeve is driven, is mounted coaxially with the cylinder container, or may be arranged independently, so that the position of the

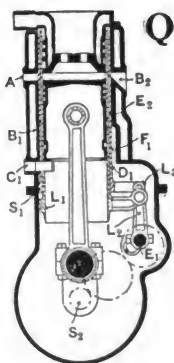


Fig. Q—Sectional view of the Chalmers motor, showing the two spherical sleeves interposed between the piston and cylinder walls and the intake and exhaust passageways.

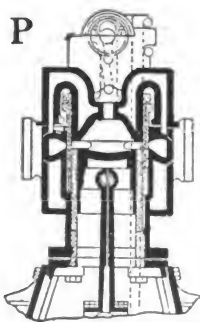


Fig. P—Transverse sectional view of the McIntosh motor, showing the relation of the sleeves to the ports of admission and exhaust.

shaft and the motion of the outer sleeve are unaffected by movements of the lever L1. The shaft S3 on the other hand receives motion of two kinds when the lever L2 is operated; it is displaced bodily parallel to itself in such a manner that the duration of the period during which the inner sleeve ports are uncovered with respect to the cylinder head is varied, the timing of mean position of the dead center being substantially unaffected by this component of the motion, but it receives a rotary motion due to the epicyclic action of the gears whereby the timing of mean position of the sleeve is also caused to vary.

McIntosh Sleeve Type of Motor Has an Overhead Mechanism.

Referring to Figs. O and P of sections through one of the cylinders in two planes, the sleeves are given reciprocating motion from an eccentric shaft E1 mounted on the top of the cylinder through links L1 for the sleeve S1 and L2 for the sleeve S2. According to British patent specifications 28,061, this motor is of the four-cycle type with two reciprocating cylindrical valve sleeves arranged concentrically with the working cylinder. Power is transmitted to the operating mechanism from the main shaft through an inclosed skew and a vertical spindle to a lay or second shaft situated along the center of the cylinder head. The arrangement of the cranks, and valve ports, up-

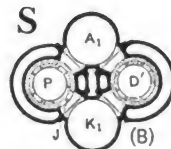


Fig. S—A shows operation of Callow & Humphrey rotary sleeve valve motor by means of bevel gearing. B, sectional view of cylinders showing relation of packing ring to sleeve.

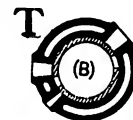


Fig. T—Section of the Kitchen motor, showing how a single sleeve of the rotary type is operated by worm gearing.

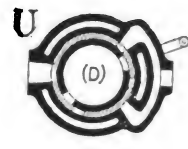


Fig. U—Another example of the Kitchen motor in which an outer sleeve is interposed between the rotary sleeve and the cylinder wall in order to regulate the admission and exhaust.

on sleeves, and the movements of the sleeves, for the opening and closing of the valve ports is stated to be similar to the present practice in the Knight type of motor. The shaft E1 carries upon it at a position at each end of each cylinder a pair of these cranks or eccentrics from which power is transmitted to the valve sleeves.

Riley Imparts Motion to the Sleeves in an Ingenious Way.

Referring to Fig. L, the section (A) through a cylinder of a motor shows the pair of sleeves S1 and S2 within the bore of the cylinder in the concentric relation with the piston with an inserted cylinder head C1 and inlet and exhaust ports P1 and P2 as in the Knight motor, and the sketch (B) shows the four pairs of sleeves for an equal number of cylinders operated from an eccentric shaft E1 placed slightly in advance of the front cylinder of the motor, imparting motion to arms A1 and A2 lying parallel to each other in the plane of the crankshaft, the diameter of the cylinder apart and bell cranks, connecting these arms to the sleeves in the respective cylinders of the motor, imparting motion thereto.

Carroll & Ripley Use a Single Rotating Sleeve.

In Fig. R showing the elevation of a motor in part section, and a single sleeve S1, concentric with the piston P1 in the

cylinder C1, with an inserted head H1, with means for water cooling, the sleeve S1 is rotated, taking power from the crankshaft C2 through the bevel gear set G1 to the spur gear G2, meshing with a gear G3 on the lower extremity of the rotating sleeve. As the sleeve rotates it covers and uncovers suitably contrived ports according to the four-cycle principle.

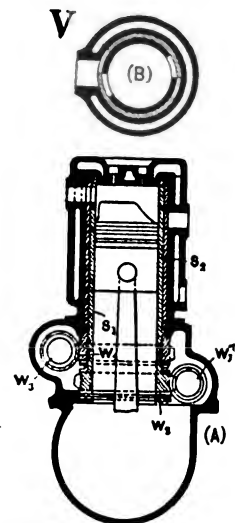


Fig. V—A, sectional view of a further example of the Kitchen motor in which two sleeves of the rotary type are driven by worm gearing. B shows the relation of the water jacketed cylinder to the two sleeves.

The sleeve of the adjacent cylinder is also fitted with a toothed ring which meshes with the tooth ring G3 and in this manner takes motion therefrom. The small section of the cylinder head shows the sleeve as it is related to a port when either on the intake or exhaust stroke. The sleeve extends throughout the whole length of the cylinder, its port opening being sealed during compression and explosion by means of a semi-ring which is located in a corresponding recess, formed in the periphery of the head and a flat spring placed between the inner face of the semi-ring and the bottom of the recess. Packing rings are located in the head as a security against leakage.

Callow & Humphrey Employ a Rotating Single Sleeve.

In Fig. S showing a cylinder of a motor in section, the sleeve S1, in the cylinder C1 is concentric with the piston P1, and the sleeve is rotated from the crankshaft C2 through a halftime gearset G1 and a bevel gearset B1 with one of the bevel gears flanged to the lower extremity of the sleeve S1. The sleeve is provided with packing rings at the approach of both extremities protecting ports against leakage, controlling the inlet and exhaust flow to these ports in the cylinder walls. The section (B) through a pair of cylinders shows the horizontal action. The port E in the sleeve is slightly larger than the port J in the packing ring, so that the pressure in the cylinder during compression and explosion stroke acts upon the exposed parts of the packing ring and secures good contact between it and the cylinder wall. At other points in the sleeve apertures D and D1 are provided for the purpose of increasing this effect. A gas admission chamber A1 and expansion chamber K1 are provided in communication with the inlet and exhaust ports of the cylinder respectively. Near the lower end of the sleeve S1 in Fig. S a collar C2 rests in a bearing N in the cylinder base plate.

J. G. A. Kitchen Contributes a Quota of Sleeves.

Fig. T gives sections A and B of a rotating sleeve type of motor and referring to section A the sleeve S1 between the piston P1 and the cylinder C1 is given rotation by the worm W1 and the worm wheel W2, the latter being on the bottom end of the sleeve within the cylinder and the relation of the sleeve covers and uncovers the inlet and exhaust ports successively according to the four-cycle principle.

Kitchen also worked upon a design of a sleeve type of motor as shown in Fig. U which is given in sections C and D. The inner sleeve S1 is operated by a worm W1 in mesh with a worm wheel W2 in the same manner as the rotation of the sleeve in the cylinder as shown in Fig. T. The two sleeves in Fig. U are concentric with the piston P1 of the cylinder C1. The outer sleeve in this motor is actuated by the lever L1 through a controlling mechanism, and the ports in the outer sleeve are so arranged as to control the incoming mixture.

Kitchen has also worked upon the double sleeve type of motor as shown in Fig. V showing a section through the cylinder at A and a section across the cylinder at B. In this motor the inner sleeve S1 is rotated by means of the worm W1 meshing with the wheel W2, and the outer sleeve S2 is given rotation by the worm W3 meshing with the wheel W4. The section B shows the relation of the ports in the sleeves, they being covered and uncovered due to the rotation of the sleeves and the relation that exists between them.

I. E. Sears Operates a Pair of Sleeves from the Top.

Referring to Fig. W showing a section through the Sears motor, and the sleeve S1 concentric with the pistons P1 and P11 in the cylinder C1, covering and uncovering ports P2 and P3. Reciprocating motion is imparted to the sleeve through the eccentric shaft S1 by means of the connecting rod C2 for the auxiliary piston, and the connecting rod C3 for the sleeve. The sleeve is shown with the ports covered, and the operation of the motor conforms to the four-cycle principle. This motor differs from all of the other types illustrated to the extent that an auxiliary piston works in conjunction with the main piston in the cylinder.

COMMERCIAL TRUCK "GUARANTEE."

The Motor Truck Club, of New York City, has framed a model guarantee for commercial vehicle application, which is tentatively advanced with the object of obtaining possible criticism pending its final adoption by the members of the club, who are agents and dealers in the Metropolitan district. The agreement provides for the shipment to the purchaser prepaid of parts that have proved defective in workmanship or material, within six months of the date of original shipment. Tire replacements, "wear and tear" and "accidents" are excluded, and a special "snapper" clause is added which provides for the termination of the contract upon the truck being "overloaded, misused or neglected," or upon its being equipped with a body not approved by the manufacturer.

In presenting its suggestion the committee, which consists of John Hanson Kennard, chairman, Couple-Gear Co.; E. Lascaris, DeDion-Bouton; A. N. Bingham, Hewitt Motor Truck Co.; and Charles E. Stone, Alden-Sampson Manufacturing Co., makes the rather striking assertion that contrary to the ordinary supposition, the guarantee is a means of protecting the manufacturer against the purchaser. Instead of the purchaser requiring protection against the maker, it is held that the manufacturer needs to be guarded against the impositions of the unscrupulous user.

"It is generally supposed that a guarantee is the protection which the purchaser has against the manufacturer," says the report, "but the committee is of the opinion that, as a matter of fact, it is the protection of the manufacturer against the purchaser. A responsible manufacturer will always protect the purchaser in every reasonable manner, irrespective of guarantees, as good faith and good business require it, but the unreasonable and unfair purchaser is the one who always seeks to hold the manufacturer to the letter of his contract, and against such persons the manufacturer must look to his written agreement for his protection. The guarantee given with a truck does not mean that the manufacturer is going to limit himself to what is there expressed, but it means that if he is not fairly dealt with he cannot be called upon for more than that guarantee agrees to do."

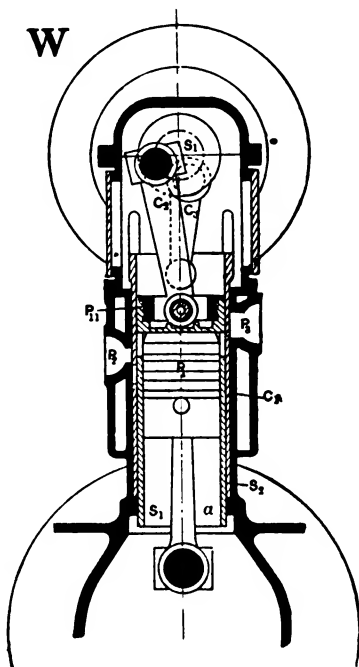


Fig. W—Sectional view of Sears reciprocating sleeve valve motor, sleeve being operated by overhead eccentric shaft; in this type two pistons are used in each cylinder.

THE McINTYRE PROPOSITION.

The dealer will be interested in the advertisement of the W. H. McIntyre Co.

It deals with one of the greatest exploitation schemes conceived since the automobile business became a fact.

This company has spent a great deal of time in preparing this bulletin and everyone ought to read it—carefully. It means dollars to the dealer. It means a complete plan for exploiting one of the greatest automobile trucks the world has ever known.

This company has thoroughly investigated the existing conditions dealing with the truck business and have come to the conclusion that, though the truck business is in its infancy, dealers have not yet "caught on" to the best method of exploiting the sale of trucks.

The automobile truck is a demonstrating proposition. Nobody buys by mail; nobody buys because he has seen an advertisement in a national magazine. It is a "show me" business.

Frequently the dealers do not get proper attention when calling upon merchants and soliciting business. The merchants of America have not yet realized the absolute economy and necessity of the automobile truck. Here is devised a plan that will compel the attention of merchants living in the dealer's city and vicinity, a plan that will positively bring the people into his place of business—a plan that is being successfully operated now by some dealers, and a plan that must prove itself a great boon to the truck dealers.

This company purposes, with the dealer's co-operation, to start things. The truck business is not a seasonable business—it's twelve months—365 days in the year are its season.

COLUMBIA CARRIAGE CO. RECEIVERS ASK FOR AN EARLY SALE.

An involuntary petition in bankruptcy has been filed against the Columbia Carriage Co., Hamilton, Ohio., by the American Oak Leather Co., Eberhard Mfg. Co., American Naval Stores Co. R. M. Kennedy, secretary-treasurer of the company, testified that failure of the company was due to erection of a \$60,000 building, expenditure of \$25,000 experimenting on automobiles, putting \$30,000 into the Carriage Woodwork Company, and getting \$14,500 from the Miami National Bank. Total assets of the Columbia on May 15, he said, were \$459,000.

On August 4 an application was filed in the Common Pleas Court by the receivers for an early sale of the plant in order to be able to make contracts with dealers and jobbers to successfully carry on its business. The following financial statement of the condition is given by the receivers: Cash on hand, \$37,283.62; bills receivable, \$50,097.51; accounts receivable, \$63,866.21. They further asked the court to appoint three disinterested freeholders to take an inventory, and make an appraisal of all the property and assets of the company, and for an order of sale directing these receivers to advertise the plant of the Columbia Carriage Company for sale.

COLE MOTOR CO. BUYS SITE.

A deal has been closed whereby the Cole Motor Car Company, Indianapolis, Ind., has bought the property now occupied by the motor car company, at 744-750 East Washington Street, the property adjoining it. The consideration was \$150,000. The motor car company will erect a four-story building of concrete and steel. The new building which will join the present building of the motor car company, will be one hundred feet wide and 190 feet deep, and its cost will be \$50,000 or \$60,000. It is the intention to use part of it for the growth of the present departments in the old building, and also to move into it the body finishing department now occupying part of a building in West Maryland street. Ultimately it is the intention to move into it the painting, trimming and shipping departments that are now at 850 East Washington street.

GOODRICH ROUTE BOOKS.

The route books which the B. F. Goodrich Company, of Akron, Ohio, is publishing, add the final touch to its most interesting public service enterprise of marking roads. Not content with the task of putting up its system of markers, the company is now endeavoring to make these the most widely known, and most readily followed routes in the country. Upon the completion of the first five routes by the road marking crews, a series of route books has been published which cover the route from Cleveland, Ohio, to New York City, via Buffalo and Albany; also routes from New York and Philadelphia to Atlantic City and Lakewood, N. J.

The manner of getting up these books has been most interesting. In order that the information might be had at first hand, a card was made out for each one of the hundreds of markers, at the time it was erected. These cards, which were filed away, contained accurate descriptions of the roads, and all the information necessary to a tourist. Bad curves, railroad crossings and bridges were noted on them. A complete record was kept of all gasoline stations, repair garages, first class hotels and towns where Goodrich tires were sold. With this complete data at hand, the routes were described in a brief but comprehensive manner. A map was made for each route. The main road was indicated by a heavy line, intersecting roads by a lighter line. The location of every Goodrich road marker was shown by an appropriate symbol, and railroads and streams were located. For cities and large towns where the streets might be confusing, city maps were prepared, showing the streets which should be followed. Nothing was left out that could be put in to help the tourist.

But the routing directions and maps are not the only features of interest in these books. Each one contains a list of tire pointers which should be of great interest to all tire users. These are followed by "How to Repair a Simple Puncture," "How to Repair a Small Hole or Cut in the Casing," a table of Goodrich interchangeable, oversize tires, a weight and inflation schedule for tires, a digest of the motor vehicle laws of every state, and a list of Goodrich branches and wholesale stock depots. The size of 5x9½ inches makes them convenient to carry in the coat pocket.

THE FIVE BOOKLETS TELL HOW.

A phrase by a writer on varnish topics is quoted by Valentine & Company, who think the writer is not abreast of the times. It goes this way: "The time comes—in these fast days is sure to come—when an unusually quick method of painting and finishing a carriage body from the wood up is called for. They say the answer is right here now and the word is Vanadium. The outstanding merit claimed for the Vanadium Varnishes is extreme rapidity with no sacrifice of brilliancy and permanency.

At a rather heavy expense, a series of five booklets has been issued by Valentine & Company, that gives the story of the Vanadium line in a way that will prove interesting and informing. Valentine & Company offer to send the booklets to any one who asks for them.

One of the booklets describes the Celox Four Day system, which takes a job from the wood up from Tuesday morning to Saturday morning.

RULES FOR N.A.A.M. SHOW.

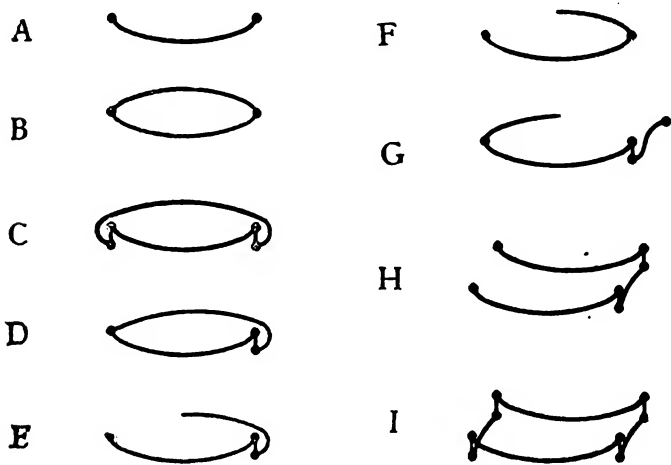
Rules have been issued to govern the Twelfth Annual National Automobile Exhibition, which will be held at the Grand Central Palace, New York, January 10-17, 1912. They provide that exhibitors at unsanctioned shows shall be barred. The main and second floors of the building will be used for pleasure car displays and the wall spaces for commercials. Accessories will be displayed on the third floor. Price of space is \$1.25 per square foot. One-half of the net proceeds will be rebated to exhibitors. General admission will be 50 cents.

Automobile Department

AUTOMOBILE SPRING STANDARDS.

Following is the report of the Spring Division of the Standards Committee of the Society of Automobile Engineers, presented at the June meeting, held at Dayton, Ohio. The report includes suggestions as to standard nomenclature, followed by recommendations tending toward uniformity in the ordering of automobile springs from the makers.

Nomenclature.



A—half elliptic.

B—Elliptic; consists of: top half, elliptic; bottom half, elliptic. Joined at ends by bolts.

C—Scroll elliptic; consists of: top half, scroll; bottom half, elliptic. Joined at ends by shackles.

D—Scroll elliptic (one end); consists of: top half, scroll (one end); bottom half, elliptic. Joined at one end by bolt, at the other by shackle.

E—Three-quarter scroll elliptic; consists of: upper quarter, scroll; bottom half, elliptic. Joined at one end by shackle.

F—Three-quarter elliptic; consists of: upper quarter, elliptic; bottom half, elliptic. Joined at both ends by bolts.

G—three-quarter coach; consists of: upper quarter, elliptic; lower half, elliptic and transverse spring. Joined at one end by bolt and to transverse spring by shackles. Transverse meaning parallel to axle.

H—Three-point suspension; consists of: two side members, half elliptic, parallel to frame and half elliptic transverse spring, joined to transverse spring by shackles.

I—Four-point suspension; consists of: two side members, half elliptic, parallel to frame, and two half-elliptic transverse springs. Joined to transverse springs by shackles.

Recommendations for Ordering Springs.

A—Give type of springs desired. Exercise great care to select types suited for purposes to which put.

B—Specify material.

C—Specify width of spring either by 000 or $\frac{1}{4}$ inch.

Standard Sizes.

Note—Pleasure Cars— $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, $2\frac{1}{2}$, 3 inches; commercial cars—2, $2\frac{1}{4}$, $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$ inches.

D—Number of leaves in gauge to be left to the spring maker.

E—Specify length in the following manner:

On half elliptic, give offset, stating length on both ends on straight line between holes in brackets. This should be given on all half elliptics.

On elliptics, length center to center of eyes under full passenger or merchandise load.

On full scroll, length center to center of eyes of lower half elliptic under full passenger or merchandise load.

On three-quarter scroll, bottom half, give distance on straight line from hole of front bracket rear spring to point on frame vertical to rear axle. Top quarter distance on straight line from center hole bracket holding upper quarter, to point vertical to rear eye of quarter under load.

Shackles connecting bottom half to upper quarter must be vertical under load; spring seat on axle and on bracket holding upper quarter parallel under full load and parallel to floor line.

Transverse spring, same length as half elliptic.

Give length center to center of side member spring seat on three-point suspension and on other types, center of holes in fixed bracket to which shackles are connected.

Three-point suspension, give distance on horizontal line parallel to frame between center of hole on front bracket rear spring and center of bracket supported by rear spring.

Give overall opening under load of car, with and without passengers. Opening on half elliptic to be from straight line through center of eyes to short leaf inclusive.

On three-quarter scroll, give distance from spring seat to spring seat or bracket holding upper quarter.

Do not give depth of scroll.

Give clearance under load with passengers, in front of two nearest striking points and position relative to rear axle.

Give center of load front relative to front axle.

Give center of load rear relative to rear axle.

State whether spring takes driving.

Give number of passengers.

On trucks give merchandise load.

Give load with and without passengers on each spring (not pairs).

With three-point suspension in rear, give weight on total platform.

Flexibility.

Give average deflection per 100 pounds.

Features to be Left to Spring Maker.

Eye up or down, in or out.

Spacing of leaves.

Position or rebound clip, except on front springs to avoid contact with tire on other parts.

State whether shackles are under compression or tension and length of shackle used.

Bushings—Bronze or steel, $\frac{1}{8}$ -inch wall.

Eyes—One leaf to form eye on truck or pleasure car springs.

Nibs—If used, to be $\frac{3}{8}$ -inch diameter; $\frac{3}{4}$ -inch C to C where two are used. Head on center bolt of stud to be fillister style.

Center bolt sizes—Recommended (There has been some difference of opinion on these items):

Pleasure cars—up to 2, 5-16, $2\frac{1}{4}$ to 3, $\frac{3}{8}$ inches, $\frac{1}{2}$ -inch diameter head, $\frac{1}{2}$ -inch high head.

Commercial cars—2, 5-16-inch; $\frac{5}{8}$ -inch diameter by $\frac{1}{2}$ -inch head. $2\frac{1}{4}$ to $2\frac{1}{2}$ -inch, $\frac{3}{8}$ -inch; $\frac{5}{8}$ -inch diameter by $\frac{1}{2}$ -inch head. 3 to $3\frac{1}{2}$ -inch, 7-16; $\frac{3}{4}$ -inch diameter by $\frac{3}{4}$ -inch head. 4 to $4\frac{1}{2}$ -inch, $\frac{1}{2}$ -inch; $\frac{3}{4}$ -inch diameter by $\frac{1}{2}$ -inch head.

Oilers—Standard thread— $\frac{1}{8}$ -inch pipe.

Rebound clips—Recommended in all cases.

Limits—Bore of bushing 0 to +0.005-inch; bore of eye 0 to +0.005-inch.

Thread—A. L. A. M. standard.

Nuts—Hexagonal or slab oval.

BOARD OF TRADE COMMENCES.

The first meeting of the general membership of the Automobile Board of Trade, which has been in legal existence for three months, was held in New York, July 6. It then took over the offices of the A. L. A. M. and decided that its affairs, including the members' reports of their respective production of cars, shall bear date as of July 1st. On these reports of outputs, which will be rendered quarterly, the amount of annual dues will be based, on a ratio of one-tenth of one per cent.

The subjects of shows and patents were discussed, but as the lease of Madison Square Garden still stands in the name of the Association of Licensed Automobile Manufacturers, which has not been wound up, the matter of shows was touched only in a more or less informal manner. The matter of patents received more attention, and while no official statement to that effect has been issued, it is known that a decision has been reached to pursue an aggressive campaign in that direction. There is no Selden patent in hand, but there are a number of far-reaching patents owned by members of the Board of Trade which have been permitted to lie dormant, but which it is the intention to take up and actively exploit, with a view of bringing infringers to book.

PROUD OF HIS RECORD.

Mr. Charles W. Harris, the well known rubber man, who is now the western sales manager for the Swinehart Tire & Rubber Co., and located in Chicago, is taking considerable pride in a re-order which he received a few days ago. The renewal consisted of a 36x4 inch single truck tire of clincher flange type from a three-ton truck belonging to James B. Clow Co., of Chicago, after twenty thousand miles of service. Also a 36x5 inch tire of the same type used by the Brunswick-Balke-Colander Co., Chicago, after eighteen thousand miles' service. Mr. Harris claims that both these tires are worn down to the flange with the base perfect and there was no sign of wear on the pins nor any movement in the base whatever. It is no wonder that Mr. Harris is proud of his record in the sale of the two new tires, for it means a high quality of rubber and perfect fastening to produce such a record.

BUYS FEDERAL RUBBER.

A group of well known men in the rubber manufacturing and automobile industry have acquired the business of the Federal Rubber Company, of Milwaukee, and the new corporation, which will operate under the corporate name of the Federal Rubber Mfg. Co., recently assumed control. The company has a capitalization of \$1,000,000. Byron C. Dowse is president of the new company, H. A. Githens is vice-president and manager, of sales, and Richard Ward, secretary and treasurer. These men have previously held the same offices with the G. & J. Tire Company, of Indianapolis.

The Federal Rubber Co. maintains an office in Milwaukee while their plant is located at Cudahy, on the Northwestern Railroad. Here the company owns five acres of land with three substantial buildings which are being remodeled, and are at the present time building four additional three-story buildings for manufacturing purposes, and a separate office building. When these buildings are completed they will have five or six acres of floor space. Despite the fact that the company is but a few weeks old orders are pouring in and the further success of the company seems assured.

RATES OF FARE TO C. B. N. A. CONVENTION.

Secretary McLear announces that arrangements have been made to take advantage of the "certificate plan" in order to get the best possible rates for the members of the Carriage Builders' National Association who attend the convention at Atlantic City, September 25th to 29th.

COURT SUSTAINS WEED PATENTS.

The Circuit Court of Appeals for the seventh district in the northern district of Illinois, eastern division, decided, July 27, that the Weed Chain Tire Grip Co., of New York, has won its suit against the Excelsior Supply Co. and the Motor Appliances Co., of Chicago, relative to the validity of the Parsons patent. This patent refers to anti-skid chains for motor car tires, and this decision means that the Weed Company is made supreme in this field in that it controls the only patent which covers tire chains that permit of circumferential creeping around the tire and that all others employing such means are infringers. By the decision the Weed Company is granted a perpetual injunction against the Excelsior Supply Co. and the Motor Appliance Co. and the Pitts Anti-Skid Chain Co., restraining these concerns from infringement of the Parsons patent by manufacturing, imitating or vending it. The decision also gives the Weed Company power to assess or cause to be assessed damages sustained by reason of the infringement and also profits to be accounted for by the defendants.

TWENTY-FIRST ANNUAL CONVENTION OF THE C. H. A. T.

The twenty-first annual convention of the Carriage, Harness and Accessory Traveling Men's Association will meet on the Million Dollar Pier, Atlantic City, N. J., Sept. 27, 1911. As the C. B. N. A. holds its convention the same week at the same place, this will give the C. H. A. T. members an opportunity to combine business with pleasure. The C. B. N. A. has very kindly reserved the evening of Wednesday, the 27th, as C. H. A. T. night. The committee of the Traveling Men's Association will spare no pains to make this meeting the most successful one of the organization's history, and an event in the carriage men's week at the seashore.

MIFFLINBURG BODY & GEAR CO.

The Mifflinburg (Pa.) Body & Gear Co. is a new industry whose plant will be in operation about September 1. The company will build vehicle bodies, seats and gears, ironed, in the white, also gear woods for the trade. A specialty will be made of automobile bodies. Its plant will be equipped with machinery of the latest pattern and will be lighted by electricity. Horace W. Orwig is general manager and treasurer; O. S. Bucke, who was with the York Wagon Gear Co., York, Pa., for twelve years as draftsman and superintendent, is connected with the new company and is vice-president and general superintendent. Mr. Bucke is well qualified for his position.

MCCUE GETS A WESTERN FACTORY.

Incorporation papers have been filed at Albany, N. Y., for a \$700,000 automobile axle and forging company to be located at No. 1700 Elm street, Buffalo, N. Y. The McCue Company, of Hartford, Conn., and the Superior Axle and Forge Co., of Buffalo, consolidated their interests and the new company will be known as the McCue Company, which takes over and will operate both factories, the Buffalo company retiring. C. T. McCue, president and general manager of the McCue Company, in Hartford, will be president and general manager of the new company.

EXPANSION OF ROCK ISLAND PLOW CO.

At a meeting of stockholders of the Rock Island (Ill.) Plow Company, held July 31, the capital stock of the concern was increased from \$2,200,000 to \$6,000,000. The increase of \$3,800,000 consists of 30,000 shares of preferred stock and 8,000 shares of common stock of the par value of \$100 each. A resolution was adopted which permits of a wide extension of the company's business.

Trade News From Near and Far

BUSINESS CHANGES.

Ed. Quam has purchased the stock of vehicles, etc., of Grove Bros., in Roland, Ia.

John Hinrichs has purchased the stock of vehicles of Koranda Bros., in Kimball, S. D.

Fred Brown has purchased the stock of vehicles, etc., of F. A. Sturtevant, in Lawton, Ia.

Walter Kinser has disposed of his stock of vehicles, etc., in Sewall, Ia., to E. G. Stewart.

Helber & Rickard have disposed of their stock of vehicles, etc., in Alda, Neb., to Frank Denman.

R. G. Sutton has purchased the stock of buggies, etc., of Thomason & Son, in Mitchellville, Ia.

P. N. Peterson has purchased the stock of buggies, etc., of Caldwell & Wilson, in Brookings, S. D.

Rogers & Williams have disposed of their stock of vehicles, etc., in Jet, Okla., to F. F. Linden & Co.

The Kinsey Motor Car Co., of Detroit, Mich., has changed its name to the Jefferson Motor Car Co.

George Lightbody has purchased the vehicle and implement business of M. Fullmer in Harbine, Neb.

John J. Lutz has purchased the stock of buggies, hardware, etc., of Kistler & Arndt, in Alta Vista, Kas.

George Duis, of Grand Forks, N. D., is planning the opening of a stock of vehicles, etc., in Williston, N. D.

The Sycamore (Ill.) Wagon Works, is moving to its new location in the old shoe factory plant in DeKalb.

R. P. O'Leary has disposed of his vehicle and implement business in Castleton, Kas., to S. P. Givens & Son.

John D. Dyer has disposed of a half-interest in his vehicle and implement business in Troy, Mo., to C. A. Holmes.

Peterson & Lindstrom have succeeded N. J. Lindstrom in the vehicle and implement business in Evansville, Minn.

Nelson & Cone have been succeeded in the buggy and implement business in Trent, S. D., by Culver, Bridge & Wavell.

The vehicle and implement business of Thorson Bros., in Mead, Neb., has been succeeded by the Mead Hardware Co.

George W. Armstrong has succeeded H. A. Perlstein as president of the Beaumont Carriage & Implement Co., in Beaumont, Tex.

Charles and Fred Perkins have sold their interest in the Michigan Wheel Company, Grand Rapids, Mich., to Harry Perkins, who will continue the business.

Diebolt & Gray will move their entire stock of heavy hardware to Port Huron and will also handle a line of carriages, wagons, blacksmith supplies and agricultural implements.

NEW FIRMS AND INCORPORATIONS.

Sweeney Bros. have opened a new stock of buggies, etc., in Neola, Ia.

W. W. and S. K. Rowland are about to erect a carriage factory in Sumter, S. C.

A. E. DuMez has engaged in the vehicle and hardware business in Richville, Minn.

W. F. Rankin is soon to open a new stock of vehicles and implements in York, Neb.

J. H. Arge & Co. have opened a new stock of vehicles and implements in Arcadia, Tex.

O. O. Haughland has engaged in the vehicle and hardware business in Raymond, Minn.

Hornberger & Son have opened a new stock of vehicles and implements in Fort Sumner, N. M.

George S. Hunt, South Bend, Ind., late owner of the Hunt

Bros. Manufacturing Company, has again opened business, having acquired the Vehicle Exchange.

The Gower Wagon Co. has been organized in Gainesville, Ga., with a capital stock of \$10,000.

The Rowe Vehicle Co. has been incorporated in Fort Smith, Ark., with a capital stock of \$10,000.

J. M. Doughtinghouse, of Lawrence, Kas., is soon to engage in the vehicle business in Baldwin, Kas.

S. M. Bielejeski has opened a store in Holdingford, Minn., and will handle vehicles and implements.

The Carmin & Logan Co. has been incorporated in LaCrosse, Wash., with a capital of \$5,000, to handle vehicles, etc.

The Davenport Wagon Co., has been incorporated in Moline, Ill., with a capital stock of \$300,000, by W. L. Velie and others.

Fife & Miller have incorporated at Dallas, Tex.; capital \$50,000. Incorporators: J. H. Miller, J. A. McDaniel and J. V. Carpenter. To sell vehicles of all descriptions, by wholesale and retail.

Steps will be taken soon to incorporate a new stock company at DeKalb, Ill., to manufacture the Clark combination hay and stock rack and wagon box. Capital fixed at \$60,000. Incorporators are C. L. Clark and Roy Peterson, of DeKalb, and M. D. Wood and W. H. Henderson, of Aurora.

IMPROVEMENTS—EXTENSIONS.

J. A. Dann is about to enlarge his wagon works in Miami, Fla. Waukesha (Wis.) Motor Co., has increased its capital from \$100,000 to \$200,000.

The Martin Wagon Co., Lufkin, Tex., has increased its capital from \$8,000 to \$28,000.

The Abbott Motor Co., of Detroit, Mich., has increased its capital stock from \$300,000 to \$1,050,000.

The Columbus (O.) Carriage Works has acquired the old plant of the Melbourne Buggy Co., in Newport, Ky., and will remodel and enlarge it.

The West Texas Supply Co., of Munday, Tex., has increased its capital stock from \$20,000 to \$30,000.

The W. A. Paterson Co., carriage manufacturers, of Flint, Mich., has increased its capital stock from \$200,000 to \$330,000.

The Anderson Carriage Co., Detroit, Mich., let the general contract for a new two-story addition to its present plant at Milwaukee Junction to M. E. Ryan & Son.

The Ideal Commercial Car Co., of Detroit, Mich., has increased its capital stock from \$10,000 to \$200,000.

G. C. Luthy, secretary of the Bartholomew Company, was in Chicago recently, purchasing additional machinery. Orders have been coming in from all parts of the country for Glide cars at such a rapid rate that the capacity of its factory is taxed to the utmost.

The American Wagon Co. has started work in its new factory in Dixon, Ill. The company is not yet shipping out the Melrose convertible wagon bed, but expects to be ready in not more than fifteen days. The full capacity with the present equipment will be fifty a day when all the force and machinery are in use.

The Columbus Vehicle, Apron and Hood Company, of Columbus, Ohio, has completed changes and additions at its plant on North Fourth street, which will give 15,000 additional square feet of space. The concern has been growing rapidly, and is now making accessories and fittings for automobiles almost exclusively.

FIRES.

Fire destroyed \$30,000 worth of wagon lumber in the yards

of the Smith Wagon Works, LaCrosse, Wis., and for a time threatened surrounding manufacturing plants.

C. Ruckman's repository at Mansfield, Ill., suffered a slight loss by fire.

The stock of vehicles, etc., of F. C. Christian, in Whitewright, Tex., has been destroyed by fire.

The stock of vehicles, etc., of Charles Styskall, in Dwight, Neb., has been damaged by fire. Loss \$8,000, insurance \$5,000.

Fire destroyed the three-story carriage plant of J. Metzler & Sons Company, 158-160 East Indiana street, Chicago. Loss \$10,000.

Fire damaged fourteen implement, vehicle and allied firms to the extent of \$125,000 at Omaha, Neb., July 31, in the building controlled by the Omaha Implement & Transfer Company. Following are the estimated losses: Acme Harvesting Machine Company, \$25,000; Thomas Manufacturing Company, \$18,000; Janesville Machine Company, \$15,000; J. S. Rowell Manufacturing Company, \$15,000; Capital City Carriage Company, \$8,000; D. M. Sechler Implement & Carriage Company, \$8,000; Page Woven Wire Fence Company, \$8,000; Grand Detour Plow Company, \$5,000; Stoughton Wagon Company, \$5,000; Elkhart Carriage Company, \$4,000; Buerkens Manufacturing Company, \$3,100; Lawson Gas Engine & Supply Co., \$10,000; building owned by Thomas Davis, of the First National Bank, \$10,000; total, \$136,000.

BUSINESS TROUBLES.

For the ninth time the sale at auction of the Elgin Wagon Works, material and machinery, has been continued by court orders. There was originally thought to be about \$6,000 worth of assets in the building and it was ordered to be sold at auction.

Involuntary proceedings in bankruptcy were instituted in the federal court against the Atlanta (Ga.) Motor Car Company, a business concern valued at \$15,000. The petitioning creditors are the Atlanta Buggy Company, the Standard Oil Company and the Cliff C. Hatcher Insurance Agency, who claim an indebtedness aggregating about \$2,300. The papers aver that the Atlanta Motor Car Company has consented to the proceedings against it, and a receiver is asked for.

SUES FOR \$105,000.

Because the Velie Motor Vehicle Co., of Moline, Ill., countermanded an order for 1,000 motors, the Armstrong Iron Co., of Racine, Wis., has entered suit in the United States Circuit Court in Peoria, Ill., for \$105,000. The Armstrong Company alleges that the contract called for the delivery of the motors at the rate of 60 per month and at a price of \$210 each, but none had been delivered when the order was countermanded. The plaintiffs state, however, that they already had altered their plant and incurred other expenses to the amount of \$45,000, and they are suing to recover this sum plus \$60,000 profit, which they allege the contract, if carried out, would have netted them.

CADILLAC PREPARES AGAIN TO ENLARGE.

Having acquired the necessary land, the Cadillac Motor Car Co. is about to erect several additional buildings adjoining its present plant in Detroit. They will comprise an addition to the iron foundry, 220x72 feet, a new brass foundry, 140x50 feet, and a new three-story manufacturing building, 270x60 feet. Two additional stories will be added to the body building plant also, 428x60 feet, and 60x76 feet.

WAGON STOCK DESTROYED.

The Smith Manufacturing Company, LaCrosse, Wis., lost about \$5,000 worth of wagon stock when fire broke out in its yards recently as the result of boys playing in the dry lumber sheds. One of the company's buildings was damaged somewhat.

A HELPFUL MOVE.

If it were a new "exchange," as the editor calls the journal that is sent to him free that he may "swipe" the other editor's ideas, we should look upon "The Valentine" as the most welcome little publication in the monthly class.

Fact is, it is a miniature of news, comment and informing instruction issued by Valentine & Company for the benefit of its large "sales organization," to use the phrase twaddle of the day.

Ordinarily the spirit of such ventures impresses the salesman as "preachy," and as an assumption of superiority by the men "high-up," and the effect on morale is not what it is fondly hoped it will be, though the feeling is not expressed openly.

"The Valentine" sails exactly on the other course; it becomes the full partner of the salesman and does not attempt the superior attitude. It really helps in a brotherly, man-to-man way. It is a shrewd move accepted in the right spirit, and the best feature is that the customer is also in the enjoyment of the benefit of the work, and is also being helped in his varnish troubles if he has difficulties that need solution.

THE RACINE HORSE SHOE TIRE.

Rubber being an expensive material, numerous attempts are being made to replace it in tires, at least to some extent, and the use of a leather tread on a shoe built of Sea Island cotton layers frictioned with Para rubber is the practice of making automobile tires at the factory of the Racine Auto Tire Company, Racine, Wis. The anti-skid tread is made of chrome-tanned leather, four strata of which are superimposed and united by three layers of pure up-river Para rubber. Rivets driven through the two top layers of the leather insure a non-skid effect, and from this peculiar construction has been derived the name Racine Horse-Shoe Tire.

ARMLEDER ENTERS AUTOMOBILE FIELD.

The Otto Armleder Company, Cincinnati, has joined the ranks of manufacturers in automobiles. This decision is the result of about two years of exhaustive experiments, especially in the line of a delivery vehicle of capacity for about one thousand pounds to meet the demands of medium and light transportation such as laundries, dry goods, millinery, etc. The vehicle will be called the "Armleder." J. Biederman, who has for many years been in the manufacturing plant of the Armleder Company, is the designer of the new machine.

GENERAL MOTORS HAS NEW SELLING FIRM.

The General Motors Co. has formed a special company to market commercial vehicles. The new concern will be known as the General Motors Truck Co., and will market the General Motors Company's entire output of trucks and commercial cars. A line of commercial cars comprehensive enough to cover every business requirement will eventually be out on the market. The nucleus of this line will be formed by the Rapid and the Reliance motor trucks.

NOISELESS WHEEL.

The new Noiseless Wheel and Truck Company, Cedartown, Ga., will have a capital of \$100,000, and will manufacture trucks, vehicles of various kinds, wheels and tires. Messrs. Charles Adamson, C. W. Smith, J. E. Houseal, C. B. Morris, O. Wiltingham, H. H. Van Derventer, board of directors.

ANGOLA-ECKHART.

The Angola Holding Company, Angola, Ind., has contracted with the Eckhart Automobile Works, of Auburn, Ind., for the lease to the company of the fine new buildings on North Wayne street. Their fine six-cylinder \$2,500 automobile will be manufactured there.

Recently Granted Vehicle Patents

- 980,138—Pneumatic Cushion for Vehicles. George J. Bancroft, Denver, Col.
- 979,411—Steering Device. Harry E. Bayly, assignor of one-third to R. G. Burlingame and one-third to H. M. McCormack, Indianapolis, Indiana.
- 980,051—Mud Guard. John Blaszczyk, New York, N. Y.
- 979,417—Elastic Tire for Vehicles. Arno Boerner, Briessnitz, near Dresden, Germany.
- 980,055—Automobile Driving and Supporting Wheel. Preston H. Breed, assignor to The Alden Sampson Mfg. Co., Pittsfield, Mass.
- 980,062—Automatic Lamp Operating Mechanism for Automobiles. James H. Butterfield, Logan, Ohio.
- 979,447—Means for Supporting Vehicles. Bramah J. Diplock, Westminster, England.
- 980,076—Wagon Brake. Eben G. Doland, Starksboro, Vt.
- 979,938—Automatic Emergency Brake for Automobiles. Emil Eiselt, Baltimore, Md.
- 979,468—Automobile Wheel. Joseph M. Gilbert, Mount Vernon, N. Y.
- 979,488—Dumping Wagon. John Heberling, Rochester, N. Y.
- 979,961—Non-Skid Tire. Robert H. Keaton, San Francisco, Cal.
- 979,517—Machine for Forming Heels for Vehicle Shafts. George A. Lambert, Anderson, Ind.
- 979,869-70—Cushion Tire Wheel. Charles A. Marien, St. Louis, Mo.
- 978,115—Wagon Loader. Ansel McKinney, Berclair, Tex.
- 979,882-3—John J. Patton, New York, N. Y.
- 979,694—Shock Absorber for Vehicles. Charles G. Polleys, Malden, assignor of one-half to F. C. Taft, Uxbridge, Mass.
- 979,695—Resilient Apparatus for Vehicles. Charles G. Polleys, Malden, assignor of one-half to F. C. Taft, Uxbridge, Mass.
- 979,699—Puncture Guard for Pneumatic Tires. Thomas H. Prince, Detroit, Mich.
- 979,893—Front Fastening Device for Vehicle Tops. Albert E. Smith, assignor of one-half to L. A. Young, Detroit, Mich.
- 979,722—Adjustable Wagon Box. Andrew E. Sutherland, Madrid, Ia.
- 979,816—Wheel. Frank L. White, assignor of one-half to T. F. Hutchinson, Little Rock, Ark.
- 980,855—Resilient Tread Wheel. John B. Adams, Laconia, N. H.
- 980,474—Vehicle Wheel. Charles M. Backman, Los Angeles Co., Cal.
- 980,738—Elastic Wheel. Henry G. Baldwin, San Francisco, Cal.
- 980,185—Automobile. Albert W. Benjamin, Yarker, Ontario, Canada.
- 980,589—Running Gear for Automobiles. James B. Bostian, Grand Lodge, Mich.
- 980,486—Whiffletree. Walter M. Byrd, Mount Gilead, N. C.
- 980,198—Speed Indicator. John H. Capwell, Anthony, R. I.
- 980,603—Motor Vehicle. Louis S. Clarke, Haverford, assignor to The Autocar Co., Ardmore, Pa.
- 980,605—Transmission Gearing for Automobiles. Dennis P. Collins, assignor to Collins Axle Manufacturing Company, Pittsburg, Pa.
- 980,607—Wheel. Emory H. Copenhagen, California, and W. Colvin, Dunlevy, Pa.
- 980,493—Vehicle Lamp. William J. Corcoran, Cincinnati, O.
- 980,211—Steerable Front Wheel of Motor Driven Vehicles. Paul Dalmier, Unterturkheim, Germany.
- 980,611—Cushioned Wheel. Ernest L. J. Davis, Pittsburg, Pa.
- 980,226—Resilient Wheel. Henry R. Ellis, Salt Lake City, Utah.
- 980,621—Wagon Brake. John W. Finch, Bentonla, Miss.
- 980,508—Vehicle Suspension. Joseph K. Gardner, Wyandotte, Mich.
- 980,777—Automobile Clutch Control. Ernest Havens, Summit, N. Y.
- 980,636—Steering Apparatus for Automobiles. Henry J. Hert, Indianapolis, Ind.
- 980,313—Automobile. John H. McElroy, Chicago, Ill.
- 980,556—Dumping Vehicle. Charles O. Pape, Waupeton, Iowa.
- 980,847—Variable Speed and Reversing Mechanism. Edward M. Steinle and W. J. Steinle, Chicago, Ill.
- 980,854—Draft Equalizer. John J. White, Denver, Col.
- 981,515—Resilient Wheel. Oliver H. Anderson, Sparta, assignor of one-fourth to G. I. Frazier and one-fourth to J. T. Timberlake, Nashville, Tenn.
- 980,922—Dump Bed for Vehicles. Dox W. Carr, assignor to The Greeley Mfg. Co., Greeley, Col.
- 981,168—Vehicle Top. Haldane H. Christie, Jackson, Mich.
- 981,181—Demountable Rim for Wheels. Jay W. Farnoff, assignor of one-half to J. J. Reiman, Buffalo, N. Y.
- 981,182—Tire Fastener. Jay W. Farnoff, assignor of one-half to W. J. Reiman, Buffalo, N. Y.
- 981,253—Cushioning Device for Tires. Ethelbert Favary, New York, N. Y., assignor to Favary Tire & Cushion Co.
- 981,414—Spring Wheel. Robert Graham-Woodward, assignor to Hercules Suspension Tire Co., New York, N. Y.
- 981,080—Automobile Speed Regulator. Anthony B. Griep, Aurora, Mo.
- 981,555—Spare Wheel Holding Device. John H. Hall, Sheffield, Eng.
- 980,943—Wagon Tongue Support. John Harridge, Seward, Kas.
- 981,260—Fender for Motor Vehicles. Ralph N. Harris, Columbus, O.
- 981,419—Dumping Wagon. John Heberling, Rochester, N. Y.
- 980,948—Speed Transmission Gearing. Charles W. Hering, Los Angeles, Cal.
- 981,265—Demountable Rim for Vehicle Wheel Tires. John G. and J. G. Hodgson, Jr., Maywood, Ill.
- 981,584—Demountable Resilient Tire Seating Rim for Motor Car or other Vehicle Wheels. John G. and J. G. Hodgson, Jr., Maywood, Ill.
- 981,088—Wagon Brake. John F. Jackson, Grangeville, and H. Tamm, Mace, Idaho.
- 981,091—Pneumatic Tire. Hans R. Krastel, Darmstadt, Germany.
- 980,976—Dump Wagon. Edward Ledford, assignor of one-third to H. Sauter and one-third to W. J. Gray, Toledo, O.
- 981,208—Pneumatic Tire. James MacDonnell, Haverhill, Mass.
- 981,297—Resilient Wheel Hub. Henry L. McDuffee, Gilroy, Cal.
- 981,583—Vehicle Running Gear. Augustus A. Merrill, Pioneer, assignor of one-half to H. C. Barnes, Rolfe, Iowa.
- 981,212—Cushion Tire. Joseph A. Mollitor, Chicago, Ill.
- 981,124—Resilient Wheel. Pietro Savioa, Turin, Italy.
- 981,128—Wheel. Charles W. Seeley and C. S. Ross, Hollywood, Cal.
- 981,138—Automatic Wagon Brake. Ole Syverson, Tolley, N. D.
- 981,142—Anti-Rattler and Thill Support. William N. Thomas, Marion, Alabama.
- 981,507—Vehicle Felly and Tire Holder. Robert S. Weehunt, Morgan, Texas.
- 981,831—Spring Wheel. Charles M. Backman, Los Angeles, Cal.
- 981,740—Demountable Rim. Albert R. Behnke, St. Paul, Minn.
- 981,834—Headlight for Vehicles. Joseph M. Benninghoff, Auburn, Ind., assignor to A. C. Himebaugh, Burr Oak, Mich.
- 981,611—Automobile Tire. Asa R. Brewer, Atlantic, Iowa.
- 981,618—Vehicle Tire. John Corwin, Chicago, Ill.
- 982,130—Automobile Wheel. James S. Draper, Texarkana, Ark.
- 982,177—Controlling Device for Automobiles. John Eckard, Boston, Mass.
- 982,046—Automobile Shipping Case. Charles F. Flemming, Washington, D. C.
- 981,990—Spoke Tenoning Machine. Elmer E. Fletcher, Nye, Mont.
- 982,047—Vehicle Wheel. Erwin S. Frey, New York, N. Y.
- 981,852—Automobile Jack and Tire Rest. Luther C. Gracy, Gainesville, Fla.
- 981,640—Tire Protector. Robert M. Halliday, assignor of one-half to G. C. Halliday, Mount Gilead, Ohio.
- 982,066—Headlight for Automobiles. William H. Hunt and R. C. Vroom, San Diego, Cal.
- 982,142—Automobile Lamp. Harry J. Knipple, Johnstown, Pa.
- 982,143—Vehicle Wheel. Gerard B. Lambert, New York, N. Y.
- 981,792—Means for Securing Pneumatic and Other Tires to the Rims of Wheels. Edward Owen, Llandudno, England.
- 981,794—Device for Oiling Felles. James W. Price, St. Louis, Mo.
- 981,689—Differential Speed Mechanism. Harry A. Rhodes, assignor to The Universal Motor Co., Denver, Colo.
- 981,947—Vehicle Wheel. Leo L. Rogers, Boston, Mass., assignor to Rogers Unika Wheel Co.
- 981,797—Variable Speed Transmission Device. John B. Runner, Indianapolis, Ind.
- 982,190—Pneumatic Suspension for Vehicles. William H. Shankland, St. Johns, Ore.
- 982,455—Wheel. Matthais J. Adams, and P. P. Turkey River, Iowa.
- 982,560—End Gate. Hans J. Anderson, Lake Mills, Mo.
- 982,344—Autosleigh. Peter F. D. Bellevue, East Long Meadow, Mass.
- 972,465—Tire Sleeve. Augustine E. Berg, Oakland, Cal.
- 982,573—Device for Securing Tires to Wheel Rims. Auguste L. Cade, Paris, France.
- 982,577—Automobile Fender. George W. DeClements, assignor of one-half to C. A. Coey, Chicago, Ill.
- 982,422—Automobile Body Construction. Lawson M. Fuller, assignor to Velle Motor Vehicle Co., Moline, Ill.
- 982,368—Wheel With a Special Rim for the Brake. Alfred Kastner, assignor to Fried, Krupp Aktiengesellschaft, Essen-on-the-Ruhr, Germany.
- 982,282—Shock Absorber and Motor Vehicles. Allen Loomis, assignor by mesne assignments, to Packard Motor Car Co., Detroit, Mich.
- 982,382—Automobile Starter. Frank G. McKlveen and L. W. Naylor, Denver, Colo.
- 982,630—Anti-Skidding Armor for Tires. William M. Paul, New York.
- 982,300—Hub Attaching Device. Louis Ray, Hamlet, Ind.
- 982,634—Tire. Frank Reed, Omaha, Neb.
- 982,745—Hub Attaching Device. George H. Rice, Oleander, Cal.
- 982,368—Anti-Skidding Device. William P. Scholl, South Bethlehem, assignor of one-half to J. A. Nevins, Allentown, Pa.
- 982,639—Whiffletree. Otto H. Smith, New Brunswick, N. J.
- 982,320—Vehicle Alexander Waddell, Dumferline, Scotland.
- 982,461—Vehicle. Royal W. Wagner, Spirit Lake, Iowa.
- 982,453—Tire Armor. Horatio C. Willis, Whitewright, Tex.
- 982,756—Power Transmission Attachment for Automobiles. Edward Zybach and G. Braun, Duncan, Neb.
- 983,107—Motor Vehicle. John D. Allen and J. A. Conly, Philadelphia, Pa.
- 983,112—Vehicle Axle. Norman L. Balance, Pamlico, N. C.
- 982,788—Singletree. Earnest B. Bormann, Corsica, S. D.
- 982,803—Lamp for Automobiles or Other Vehicles. Elmer D. Dunning, Philadelphia, Pa.
- 982,946—Starter for Explosion Engines in Self-Propelled Vehicles. Delamere B. Gardner, Chicago, Ill.
- 983,231—Tire Casing. Harry R. Holbrook, Attleboro, Mass.
- 983,234—Drigible Support for Lamps. Frank Jackson, assignor of one-half to C. B. Faraday, Mountain Home, Ida.
- 983,177—Vehicle Wheel. William J. Straight, Chicago, Ill.
- 983,008—Automobile Tire. Charles L. Vandervort, J. Pitt and C. F. Vandevort, Enderlin, N. D.
- 983,186—Vehicle Wheel Axle. Karl Voller, Dusseldorf, assignor to Rheinische Metallwaren-und-Maschinenfabrik, Dusseldorf-Derendorf, Germany.
- 983,103—Attachment for Automobiles. Carl R. West, Washington, Ind.
- 982,914—Shock Absorber. Ernest C. Wilcox and C. Cuno, Meriden, Conn.
- 983,417—Driving Gear for Motor Vehicles. Charles Adelhem and R. Keck, Chicago, Ill.
- 983,855—Spindle for Wheeled Vehicles. Jefferson D. Aton, assignor of one-half to W. M. Aton, Henderson, Ky.
- 983,270—Resilient Tire. Herbert M. Deeth, T. J., W. J., and H. N. Deeth, Toronto, Ontario, Canada.
- 983,612—Vehicle Wheel. William H. Fahrney, Chicago, Ill.
- 983,371—Storm Top for Buggies. William A. Hunter, Terre Haute, Ind.
- 983,285—Wagon Box and Hayrack Remover. John O. Johnson, Burt-rum, Minn.
- 983,294—Automatic Vehicle Brake. John N. Lawrence, Nevada, Mo.
- 983,502—Vehicle Mud Cleaner. Zachariah G. Leigh, Mount Hope, Alabama.
- 983,630—Headlight for Vehicles. Francis J. Madden, Duquesne, Pa.
- 983,390—Sleigh Knee. Frank P. Moritz, Oak Park, Minn.
- 983,837—Leak Alarm for Pneumatic Tires. Emil J. F. Quirlin, Tloga Center, N. Y.

983,393—Anti-Slipping Device. Herman J. Nye, Springfield, O.
 983,864—Change Speed Gearing. Demeter M. Smith, Washington, D.C.
 983,324—Runner Attachment for Wheels. Carl J. Thim, Logan, Utah.
 983,785—Tire Mold. Joseph W. Thropp, Trenton, N. J.
 983,848—Vehicle Wheel. John A. Toohey, Rockwell, assignor of one-nineteenth to Daniel G. Watkins, Dunnellon, Fla.
 983,467—Gyroscopic Steering. John C. Waldron, Brooklyn, N. Y.
 983,789—Rim for the Road Wheels of Vehicles. George Webb, Monmouth, assignor to The Spencer Moulton Rim Syndicate, Limited, London, England.
 983,333—Wagon Rack. Joseph Welfie and F. Schuler, Hamler, O.
 984,340—Vehicle Top Bow Holder. Sherman T. Allen, Detroit, Mich.
 984,186—Rim for Automobile Tires. Gustav H. Bogenhagen, Beemer, Neb.
 983,880—Vehicle Wheel Tire. Charles G. Deming, Syracuse, N. Y.
 983,991—Automobile Headlight Adjuster. Noah B. Gockley, Ephrata, Pennsylvania.
 983,992—Buggy Top. Clay Gordon, assignor of one-half to C. R. Paterson and Sons, Greenfield, O.
 984,082—Automobile Lamp. Charles W. Harris, Salem, Conn.
 984,480—Auto Headlight. Ernest J. Newling, Davenport, Iowa.
 984,432—Automobile Starting Mechanism. Lewis M. Jensen, La Grande, Ore.
 984,377—Shock Absorber. Dwight F. Kilgour, Lexington, Mass.
 984,516—Vehicle. Friedrich Kleinvogel, Newport, Ky.
 984,014—Automobile Starting Crank. Levin Michaels, Buffalo, N.Y.
 984,238—Pneumatic Suspension for Vehicles. Gordon A. Murphy, assignor of one-half to E. Hebern, Oakland, Cal.
 984,239—Deflating Tool. Ewald F. Pawsat and H. Sheboygan, Wis.
 984,026—Hub Clamp for Vehicle Wheel Supports. Charles W. Richards, Sloan, Iowa.
 984,028—Singletree. Junius F. Royals, Godwin, N. C.
 983,946—Combined Automobile Tail Light and Illuminated Number. Frederick S. Stafford, Dallas, Tex.
 984,046—Wheel Grip. Peter J. Stenson, San Francisco, Cal.
 983,947—Vehicle Wheel Brake. William L. Sterling, Brooklyn, Pa.
 984,499—Anti-Skidding Device. Edwin B. Stimson, New York, N.Y.
 984,500—Tire Protective Rivet. Edwin B. Stimpson, New York, N.Y.
 984,453—Tire Inflation Testing Appliance. Elmer A. Terpening, Geneseo, Ill.
 Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, solicitor of patents, Fendall Building, Washington, D. C.

RECENTLY EXPIRED VEHICLE PATENTS.

Patents Expired June 19, 1911.

521,459—Brake for Side-Bar Vehicles. Thomas H. Carter, Walnut, Mass.
 521,505—Blacksmith's Vise. Arthur Lennon, Fayette, Ohio.
 521,578—Axle Lubricator. Franklin P. White, Shallotte, N. C.
 521,581—Horse Detacher. Burdine Blake, London, Ohio.
 521,588—Vehicle Brake. John C. F. Hurst, Holton, Kas.
 521,661—Tire Tightener. William T. Mackey, Vancouver, Canada.
 521,692—Vehicle wheel. Charles L. Ames, Oak Park, Ill.
 521,682—Register for Rotations of Vehicle Wheels, etc. Hugh D. Studabaker, Bluffton, Ind.

Patents Expired June 26, 1911.

521,878—Sulky. Sterling Elliot, Newton, Mass.
 521,984—Vehicle Brake. William T. Lineback, Cincinnati, O.
 522,104—Tire Bolt Wrench. Joseph E. Campbell, Fairfax Station, Va.
 522,114—Vehicle Shaft Holder. Philip J. Harrah, Bloomfield, Ind.
 522,162—Tire Tightener. Edward W. Hays Vandiver, and Eli A. Thuston, Avondale, Ala.

Patents Expired July 3, 1911.

522,248—Carriage Wheel. Martin V. Woncher, Brooklyn, N. Y.
 522,387—Wagon Seat. Rasmus Pederson, Dramman, Minn.
 522,401—Vehicle Gear. Frank J. Buff, Milwaukee, Wis.
 522,402—Vehicle Axle. William H. Bustin, Watertown, Mass.
 522,420—Support for Vehicle Shafts. Whitmore Irving, Moncton, Canada.
 522,476—Lock Prop-Joint for Carriage Tops. Louis G. Mayer, Cincinnati, O.

Patents Expired June 12, 1911.

521,385—Felly for Wheels. Jeremiah T. Mosley, Shelbyville, Tex.
 521,389—Vehicle Brake. Charles Sample, Valley Grove, W. Va.
 521,415—Support for Buggy Tops. Thomas MacGlashan, Salem, Mo.
 The above lists of patents, trade marks and designs of interest to our patrons are furnished by Davis & Davis, solicitors of American and foreign Patents, Washington, D. C., and St. Paul Building, New York City.

HENDERSON WAGON WORKS.

The Coquillard Wagon Works, of Henderson, Ky., has been reorganized as the Henderson Wagon Works to better identify the enterprise with the city of Henderson and to preserve the name of Henderson as a large part of the output is of the Henderson brand which is sold largely throughout the South. The officers are: James E. Rankin, president; James R. Barret, vice-president; Paul J. Marrs, secretary.

LUND SUCCEEDS KEARNEY.

Thomas M. Kearney has tendered his resignation as director and treasurer of the Racine Sattley Company and Jacob Lund was elected to fill the vacancy. Reports have been circulated that H. E. Miles would soon take active part in connection with the operation of the big concern. Mr. Kearney, it is known, assisted in financing the business largely.

OBITUARY

Thomas P. Skelly, owner of the Philadelphia Carriage Bolt Works, Twenty-fourth street, below Callowhill, died July 27, at his summer home at Ventnor, suburb of Atlantic City, N. J. Mr. Skelly was the son of Thomas Skelly, one of the pioneer manufacturers of carriage bolts in the Eastern States. He succeeded to the business of his father in 1903. His widow and two children survive.

SENDING OUT NEW PRICE LIST.

Phineas Jones & Co., Newark, N. J., are mailing a revised rim price list to the trade. The list covers standard universal quick detachable and quick detachable demountable rims in several types and also quotes on parts which they furnish or apply. The Jones Co. makes a specialty of repairing and truing old wheels, including automobile truck wheels, and applying the different equipments. Wagons and truck makers, garages, repair shops, jobbers and others furnishing automobile wheels or having calls and inquiries ought to be on the Phineas Jones mailing list. This company is a large manufacturer of wheels, and is prepared to quote on experimental wheels for auto manufacturers, either for pleasure cars or trucks.

BODY MAKERS TAKE NOTICE

We are increasing our body works and need fifty body makers on first class automobile body work, truck bodies and other wood working. We also want three first class men on variety machines. No labor troubles. Apply to the Pope Mfg. Co., West Works, Dept. B., Hartford, Conn.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word; Initials and figures count as words. Minimum price, 30 cents for each advertisement.

HELP WANTED.

Wanted—Body builders for automobile body work, heavy and light, also machine hands on wood-working machinery. Apply: The Pope Mfg. Co., West Works, Hartford, Conn.

POSITION WANTED.

Notice—Mr. Carriage Manufacturer: Do you need a superintendent? One with a lot of experience? If so, write me and I will write you. Address Superintendent, care The Hub, 24 Murray street, New York.

AGENTS WANTED.

Wanted—First class salesman wanted to carry our line of thill couplers and axles, as a side line. Something thoroughly tried and proven a great success. With our liberal commission all workers are making big money. For particulars address Chas. Schabinger, Marshall, Mich., stating territory covered.

FOR SALE.

For Sale—Carriage wheel manufacturing plant, fully equipped, employing about 100 men. Business established in 1860. A bargain. Good reasons for selling. Address Lock Box 1095, Watertown, N. Y.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

THE SURPRISE IS YOURS

When You Open Your First Can of
MOORE VARNISH

Easy Working Perfect Flowing Long Lived
Highest Quality Under Every Label

BENJAMIN MOORE & COMPANY
Varnish Makers

New York Chicago Cleveland Toronto



ESTABLISHED 1886.

Correspondence School of Carriage and Motor Carriage Drafting

A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

Principal, THOS. MATTISON,
Hillside Avenue, Bitterne Park,
Southampton, England.

Author of "The Coach Body Makers' Guide," \$3.00; a practical treatise on "The Suspension of Carriages," "Bookkeeping," and other carriage building works.

PORTER'S BOLT CLIPPERS

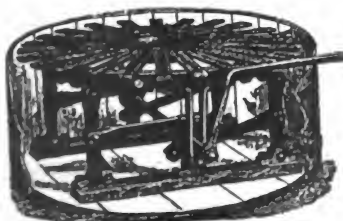
"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 inch.

H. K. PORTER,

EVERETT, MASS.



The Bokop Tire Setter and Cooler
Is the Best and Only Machine
that has stood the test during
the last 12 years on all classes of
work, and is the Only Machine
built with the indestructible
Wrought Iron Face Plate.
Over 1,000 are in successful operation,
repairs on which have not exceeded \$6.00 in the last 12 years.
For prices, references and descriptive circulars, address
BOKOP, WEBB & PALM,
Jefferson, Ohio

Please mention "The Hub" when you write.

INDEX TO ADVERTISEMENTS.

American Roller Bearing Fifth Wheel Co.	17
Ault & Wiborg Co., The	6
Bailey & Co., Inc., S. R.	15
Bokop, Webb & Palm	9
Cleveland Axle Mfg. Co.	16
Columbus Bolt Works	4th cover
Consolidated Rubber Tire Co.	2nd cover
Cooper Carriage Woodwork Co.	16
Crane & MacMahon	2nd cover
Decker, J. C.	17
Devoe, F. W., & Reynolds Co., C. T.	3rd cover
Ecles, Co., Richard	14
Frost Gear & Machine Co.	4
Gerhab, Jacob	4
Gifford & Son, John A.	9
Goodrich Co., B. F., The	5
Goodyear Tire & Rubber Co.	10
Goshen Eyelet Co.	15
Gramm Motor Car Co., The	3rd cover
Hoopes Bros. & Darlington, Inc.	2nd cover
Hotel Latham	2
Jones & Co., Phineas	3-4
Keystone Paint & Filler Co.	4
Lewis Spring & Axle Co.	17
Masury & Son, John W.	2
Mayo Radiator Co.	4
Metropolitan Lamp Co.	15
McKinnon Dash Co.	4th cover
McIntyre Co., The W. H.	11, 12, 13
Moller & Schumann Co.	3
Moore & Co., Benj.	9
National Association of Manufacturers	—
New Wapakoneta Wheel Co., The	1
Novelty Tufting Co., The	3rd cover
Oliver Typewriter Co.	14
Payne Co., E. Scott	15
Porter, H. K.	9
Racine Auto Tire Co.	14-15
Reilly, John, Inc.	2
Russell, Burdall & Ward Bolt and Nut Co.	3rd cover
Standard Oil Cloth Co.	4th cover
Timken Roller Bearing Co.	1
United Rim Co.	6
Valentine & Company	3
West Tire Setter Co.	3
Wiggers Furniture Co.	4th cover
Wilcox Mfg. Co., D.	18
Wiley Co., C. A.	4
Woodman, Joel H.	15

Protected by the U. S. Supreme Court

All Products of The Goodyear Tire & Rubber Company Exempt From Claims of Grant Patent

THE recent decision of the Supreme Court of The United States, at Washington, in the case of the Consolidated Rubber Tire Company against the Diamond Rubber Company, sustaining the Grant patent, *while making other rubber tire manufacturers accountable to the Consolidated Rubber Tire Company, in nowise affects The Goodyear Tire & Rubber Company*; for the reason that the Goodyear Company is *the only rubber tire manufacturer having had a final adjudication* of its rights to make and sell, unmolested, both Plain and Wing-shaped Tires. Petition by Consolidated Rubber Tire Company for rehearing was twice denied by the United States Supreme Court.

We are, therefore, in a position to give full protection to all customers, for past and future purchases, and have no royalties to pay on either the past or future, and, as a consequence, will not be compelled to either reduce our quality or increase our price. We stand ready to guarantee users of Goodyear Rubber against all loss and damage for past and future purchases.

Furthermore, we can and will stop the Consolidated or any other company, by injunction proceedings, should they in any way attempt to prosecute users of Goodyear rubber.

The Goodyear Tire & Rubber Company

Akron, Ohio, U. S. A.

EVERY DEALER READ THIS---OTHERS, TOO!

At Last!

Never before has there been offered such an opportunity to dealers to share in the success of an advertising campaign that is paramount and absolutely a local campaign—an advertising campaign that will run **OVER THE NAME OF THE DEALER**—a campaign that will bring customers to **YOUR** place of business, and a campaign that will be absolutely **PERSONAL TO YOU** in every respect.

Real Cash

McIntyre—the man who makes the greatest one-ton truck the world has ever known—now offers live, up-to-date dealers the opportunity to sell **A REAL TRUCK** with a **REAL ADVERTISING CAMPAIGN**. Do not lay this journal aside until you have written for the plan of advertising. The scheme will interest you and will bring customers into your place of business.

Advertising

Do You Want to Be the Biggest Automobile Truck Dealer in Your City or Town?

If so, tie up with the McIntyre line immediately. By the aid of our original local advertising campaign we will make your name known to everybody living in your community. We will make you **THE** truck dealer in your city. We will instill into the minds of your local merchants that **YOU** are a thoroughly up-to-date business man, and the advertising which will be done **OVER YOUR NAME** must convince the people of your community that you are thoroughly up-to-date. This advertising must not be cyclonic, but it will be effective; it will appear in your local newspapers in such a way as to attract attention. The advertisements have been written and compiled by an organization of trained advertising writers—high salaried men—who know how to appeal to the people, and men who know how to write effective advertisements. **The Drawings and Cuts have been made by artists of repute—every advertisement is a master-piece in itself.**

For Auto Truck Dealers

We want to tie up with the best dealers in the country. We have tried this plan out and we are satisfied that it will “deliver the goods.” We are investing our money in it and all we ask is your full co-operation. Better get in touch with us by wire, 'phone or otherwise **IMMEDIATELY**. This announcement is being read by thousands of dealers. The first representative in each territory who can qualify as an agent for **McINTYRE** trucks will get the agency. Don't delay.

Over Your Name

This is a proposition which seldom comes to a dealer. Read the next page before you lay it aside. Then wire **McINTYRE** for full particulars regarding the plan.

W. H. McINTYRE CO.
AUBURN, INDIANA

Please mention "The Hub" when you write.

McIntyre

\$1350

Commercial Power Wagon



Our campaign is to stand behind the dealer and inaugurate for him a "buying campaign."

We KNOW we have the greatest one-ton truck in the world.

We KNOW there are thousands of business houses who NEED it.

We propose to make that need FELT—to make it felt so strongly that it will stir to IMMEDIATE action men who are thinking of the commercial truck as applied to their own business.

THE BUSINESS IS THERE, THE TIME IS RIGHT THIS MINUTE, AND OPPORTUNITY IS KNOCKING AT THE DOOR OF THE DEALER

The kind of dealer we want is the kind that writes us NOW—our proposition is to fire his enthusiasm and enlist him in the kind of work that brings results. Get busy NOW.



W. H. MCINTYRE CO.

AUBURN, INDIANA

Please mention "The Hub" when you write.

McIntyre

\$1350

Commercial Power Wagon

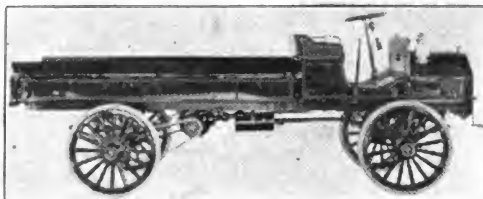
The McINTYRE Commercial Power Wagon has proved its adaptability to every commercial need. It has been aptly called "The World's Greatest Power Wagon" and is making good wherever it is in service. There has never been a commercial power wagon made that—price considered—could compare with the McINTYRE.

On account of the popularity and increased sale of our power wagons, we have increased our manufacturing facilities and are in a position to consider applications on the part of live, up-to-date dealers. First come, first served.

Investigate the McINTYRE Heavy Duty Motor with the automatic governor, which absolutely prevents overspeeding—the source of 90 per cent. of all motor truck troubles. Note the following specifications and then write for further particulars.

Capacity—2,000 pounds.	Stroke—4¾.
Wheel Base—119 inches.	Mileage capacity per gal.—12 to 15 miles.
Tires—Solid rubber, 2½ inches.	Ignition—Dual system, magneto and dry cells.
Horsepower—24.	Equipment—3 oil lamps, horn, tools and jack.
Cooling—Water-cooled.	Net Weight—2,200 pounds.
Speeds—2 speeds forward, 1 reverse; 4 to 12 miles an hour.	
Bore—5¼.	

The Owner, not the driver controls the speed. Built for hard service.



WE SELL THE CHASSIS TO THE WAGON MAKERS.

If, we repeat, if you are a live, up-to-date dealer and have the facilities and ability to sell the greatest commercial power wagon ever built, you should immediately get in touch with our sales department.

This is one of the greatest opportunities ever offered to power wagon dealers.

Act at once! Send in the coupon **now**, before you lay aside this publication. Full particulars will be sent by return mail.

W. H. McINTYRE CO.
AUBURN, IND.

COUPON.
W. H. McINTYRE CO.,
Auburn, Ind.

Gentlemen:—Please send full particulars regarding your national newspaper campaign, advertising your commercial power wagon over the dealer's name.

Name City
Address State (Hub.)

Please mention "Harness" when you write.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and that's good news involved in the handling of

THE RACINE AUTO TIRE

We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

Advertisements Classified

The following list includes advertisers in THE HUB. Each advertiser is entitled to name under one heady only. An extra charge for name under more than one heading.

- | | | | |
|---|--|--|---|
| Axles
Timken Roller Bearing Co., Canton, Ohio. | Standard Oil Cloth Co., New York. | Machinery and Tools
Bokop, Webb & Palm, Defiance, Ohio.
Porter, H. K., Everett, Mass.
Standard Automatic Mfg. Co., New York.
West Tire Setter Co., Rochester, N. Y. | Tufting Machines.
Novelty Tufting Machine Co., Chicago, Ill. |
| Automobile Radiators
Mayo Radiator Co., New Haven, Conn. | Carriage Hardware.
Gifford & Son, John A., New York.
Payne Co., E. Scott, Baltimore, Md. | Miscellaneous
Goshen Eyelet Co., Goshen, Ind.
Standard Oil Cloth Co., New York.
Uebelmesser Co., Charles R. Bayside, New York. | Varnishes, Paints and Japans
The Ault & Wiborg Co., Cincinnati, Ohio.
Devoe, F. W., and C. T. Reynolds Co., New York City.
Keystone Paint & Filler Co., Muncy, Pa.
Masury & Son, John W., New York and Chicago.
Moller & Schumann, Brooklyn, N. Y.
Murphy Varnish Co., Newark, N. J. |
| Auto Tires.
Racine Auto Tire Co., Racine, Wis. | Dashes, Fenders, Ralls, Etc.
McKinnon Dash Co., Buffalo, N. Y. | Rubber Tires
Consolidated Rubber Tire Co., New York City.
Goodrich Co., B. F., Akron, O. | Valentine & Co., New York, Chicago, Boston, Paris.
Wiley Co., C. A., Hunter's Pt., New York City. |
| Auto Trucks.
McIntyre Co., W. H., Auburn, Ind.
Gramm Motor Car Co., The Lima, Ohio. | Fifth Wheels
American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.
Wilcox Mfg. Co., D., Mechanicsburg, Pa. | Rims
United Rim Co., Akron, Ohio. | Wheels
Crane & MacMahon, New York
Gifford & Son, John A., New York.
Hoopes Bro. & Darlington, West Chester, Pa.
Jones & Co., Phineas, Newark, N. J.
New Wapakoneta Wheel Co., Wapakoneta, Ohio. |
| Bodies, Seats, Etc.
Wiggers Furniture Co., The, Cincinnati, Ohio.
Woodman, Joel H., Hoboken, New Jersey. | Finished Vehicles
Bailey & Co., Inc., S.R., Amesbury, Mass | Shaft Couplings and Anti-Rattlers
Eccles Co., Richard, Auburn, N. Y. | Wheel Stock, Bent Wood, Etc.
Crane & MacMahon, New York |
| Bolts and Nuts
Columbus Bolt Works, Columbus, Ohio.
Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N. Y. | Gear Irons
Wilcox Mfg. Co., D., Mechanicsburg, Pa. | Springs and Gears.
Lewis Spring & Axle Co., Jackson, Mich.
Frost Gear & Machine Co., Jackson, Mich. | |
| Carriage Forgings.
Columbus Bolt Works, Columbus, Ohio.
Eccles Co., Richard, Auburn, N. Y.
Gerhab, Jacob, Philadelphia, Pa. | Gear Woods
Cooper Carriage Woodwork Co., St. Louis, Mo. | | |
| Carriage Goods
Gifford & Son, John A., New York. | Lamps
Gifford & Son, John A., New York.
Metropolitan Lamp Co., Newark, N. J. | | |
| | Leather
Nelson, A. T. A., Co., Cincinnati, Ohio.
Reilly, John, Inc., Newark, N.J.
Gerhab, Jacob, Philadelphia, Pa. | | |

Please mention "The Hub" when you write.

Richard Eccles Co., Auburn N. Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile, Special

Send for Catalogue.

COOPER CARRIAGE WOODWORK CO., ST. LOUIS, MISSOURI

5401 Bulwer Ave.

Our Specialty:

High Arch Axle Beds
We Bend All Our Axle Beds

GEARWOODS

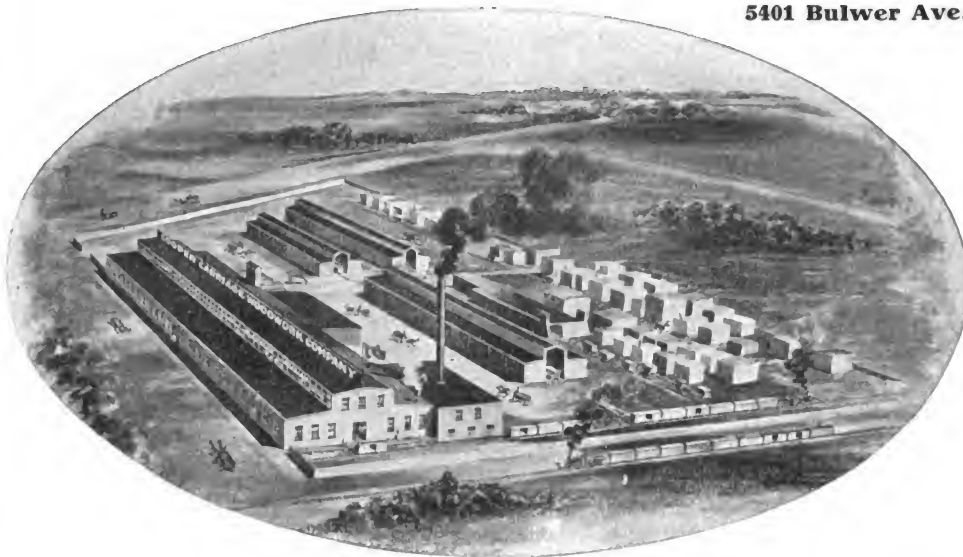
We are adding
Still More Machinery
Our Service will be
Better Than Ever

Let us Furnish
Your Gearwoods
For 1911 - 1912
Be Satisfied.

Get
The

"Cooper" Quality

There's
A
Difference



THE DALZELL LINE IS THE QUALITY LINE

Manufacturers of all styles of Wrought Iron Case Hardened Boxes and the following
well-known DALZELL BRAND OF AXLES:

Pray Spring Washer, Doctors' Special, Full Collinge,
Improved Collinge, Mail Patent.

CLEVELAND AXLE MFG. CO.
CANTON, OHIO

Please mention "The Hub" when you write.

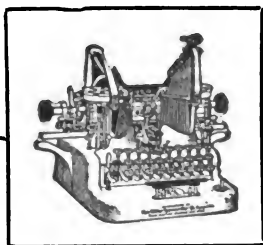
LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

SPRINGS

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN



17 Cents a Day Buys

The OLIVER

Typewriter

The Standard Visible Writer

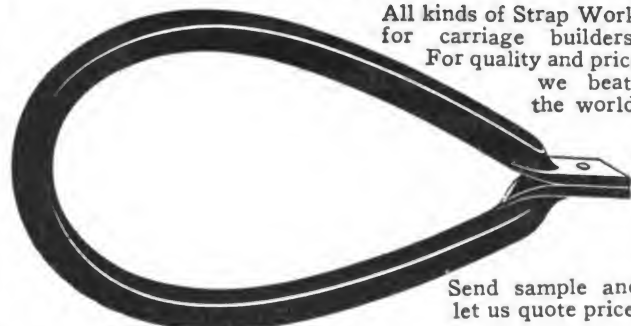
Can you spend 17 cents a day to better advantage than in the purchase of this wonderful machine?

THE OLIVER TYPEWRITER CO.

310 Broadway, NEW YORK, N. Y.

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES

All kinds of Strap Work for carriage builders. For quality and price we beat the world.



Send sample and let us quote prices

J. C. DECKER :

Montgomery, Pa.

TRUCK BUILDERS

If you only realized the inestimable value of roller bearing fifth wheels on trucks, vans, delivery wagons and all other medium and heavy vehicles, no job would leave your shop without

Roller Bearing Fifth Wheels

WHY? The adjustment is perfect. No oil or grease required. Almost indestructible. Will outwear any vehicle. Saves horseflesh and prolongs life of vehicle. Ask your jobber for the celebrated

NIELSON OR KING

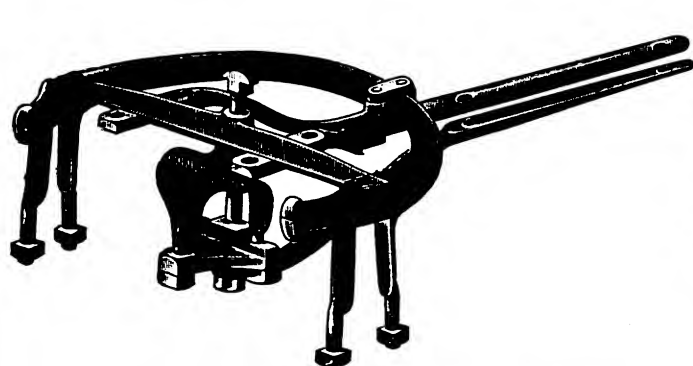
Let us send you Catalogue and Price List.

American Roller Bearing Fifth Wheel Co.

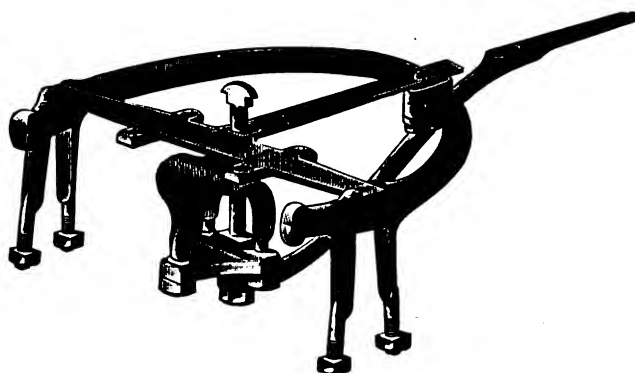
745 THIRD AVE., BROOKLYN, N. Y.

Please mention "Harness" when you write.

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



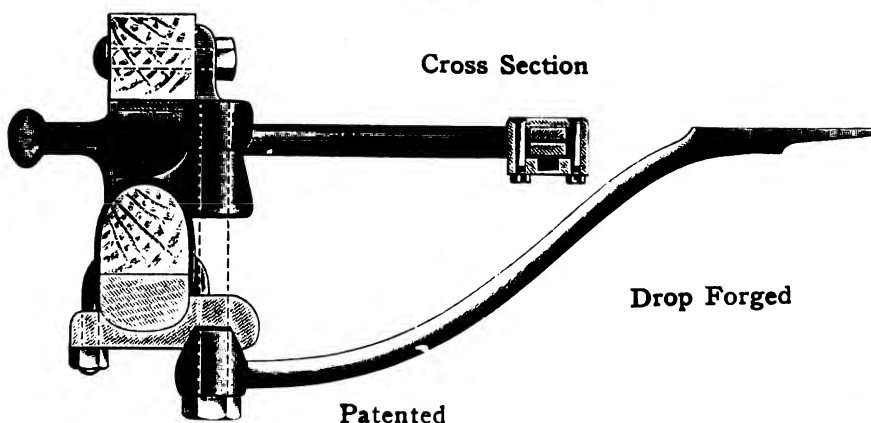
No. 1908—Gear Iron



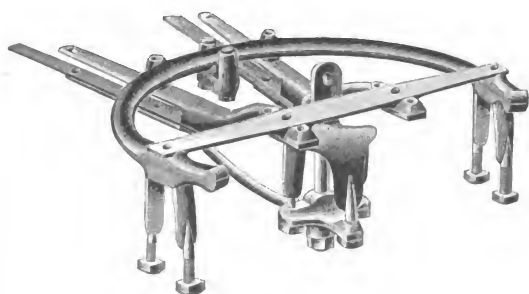
No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

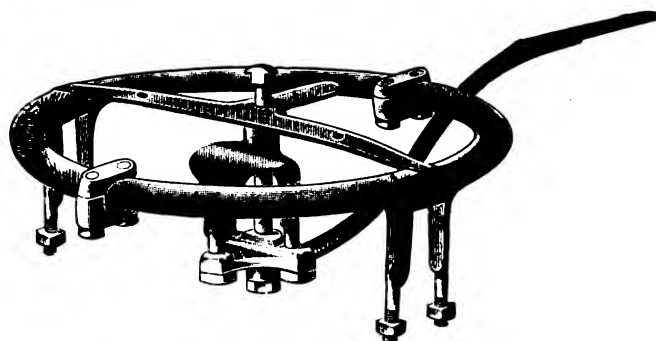
Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.



S
U
R
E
S
A
F
E



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.



THE NOVELTY TUFTING MACHINE

is a device that meets any and all requirements in the upholstering of Cushions, Backs, and other parts where upholstering is required.

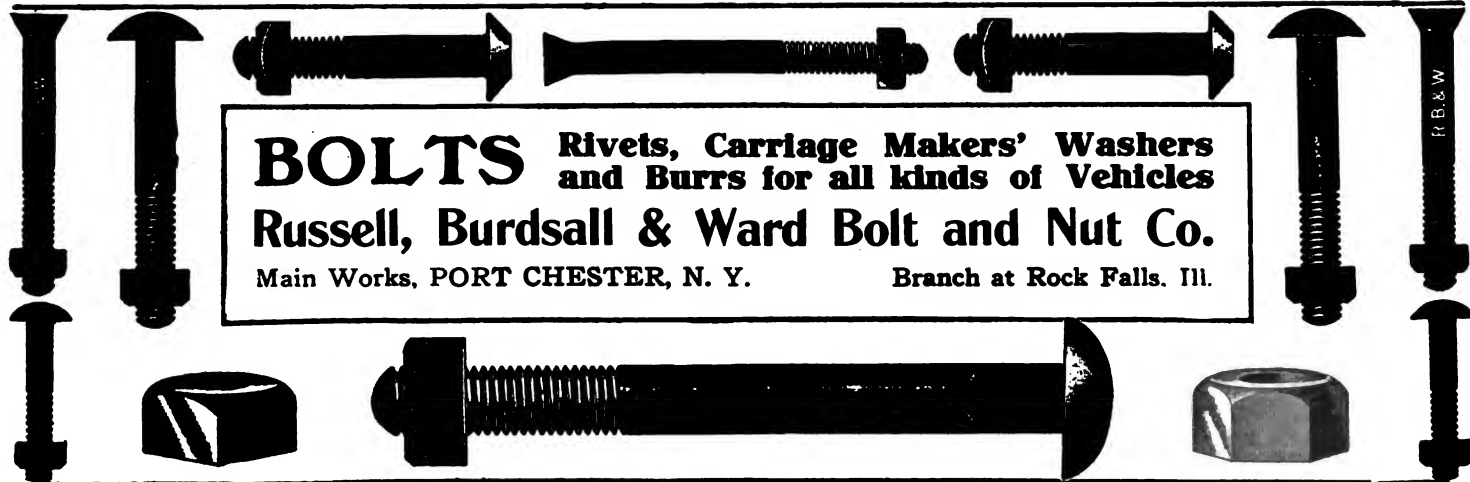
It takes up very little space; can be run by hand or power, as desired, and is so simple a boy can learn to operate it in an hour's time.

It is adapted to any grade of material or filler and we guarantee uniformity of design, using the smallest possible material allowance.

Ask for further particulars and our time-payment proposition.

NOVELTY TUFTING MACHINE COMPANY

1200 Michigan Avenue, CHICAGO, ILLINOIS

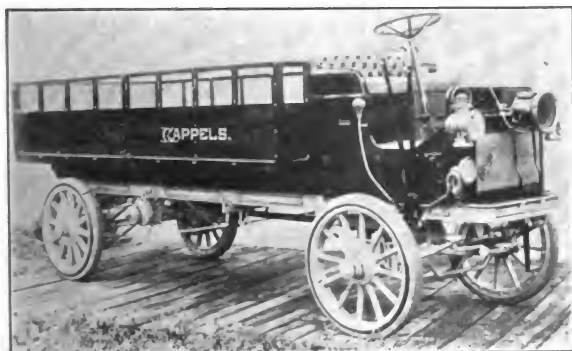


BOLTS Rivets, Carriage Makers' Washers
and Burrs for all kinds of Vehicles
Russell, Burdsall & Ward Bolt and Nut Co.

Main Works, PORT CHESTER, N. Y.

Branch at Rock Falls, Ill.

GRAMM REPRESENTATION IS A COMPLETE BUSINESS IN ITSELF



If you are interested in establishing an attractive business of immense possibilities to which you can devote all your energies, arrange with our sales department, either by letter or wire, for open territory.

The GRAMM TRUCK is built in 1, 2, 3 and 5-ton chasses.

Bodies are furnished to meet the purchaser's requirements.

THE GRAMM MOTOR CAR COMPANY,

107 South Lima Street, **Lima, Ohio.**

McKINNON DASH COMPANY

BUFFALO, N. Y.

**TROY, OHIO,
CINCINNATI, OHIO.**

**ST. CATHARINES,
ONTARIO.**



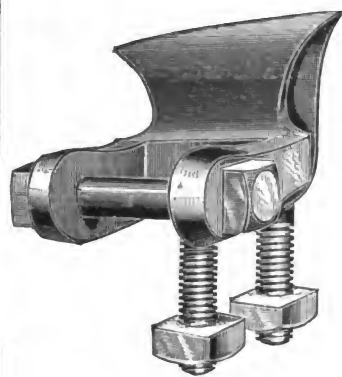
No. 263-N with Nickel Rail.

ARE YOU IN LINE

With the Leaders for 1912?

THEY WILL USE DASH RAILS

Welded Solid To The Dash Frame



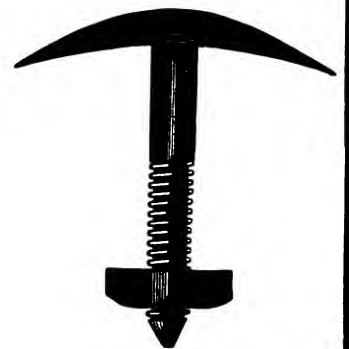
Skewed Shaft Couplings

**Regular or Oval Patterns
For High Arched Axles**

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



A. H. WIGGERS
Pres. and Mgr.

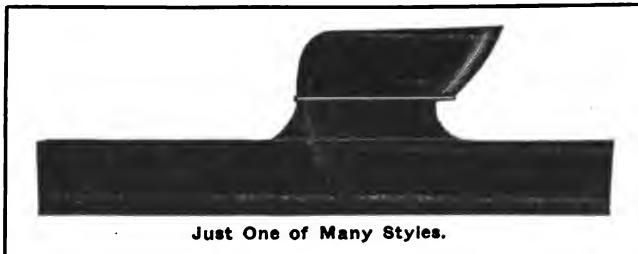
H. H. WIGGERS
Sec'y and Treas.

E. S. WIGGERS
Vice-Pres.

WIGGERS' BODIES

Automobile - Carriage

MERIT CONSIDERATION



Just One of Many Styles.

Because { **THEY** { Style
 HAVE { Quality
 Symmetrical Outlines
 AND { Well Seasoned
 ARE { Made to Wear
 Priced Right

Address

The Wiggers Furniture Co.

Manufacturers of Carriage
and Auto Bodies and Seats

1417 to 1423 Plum St.

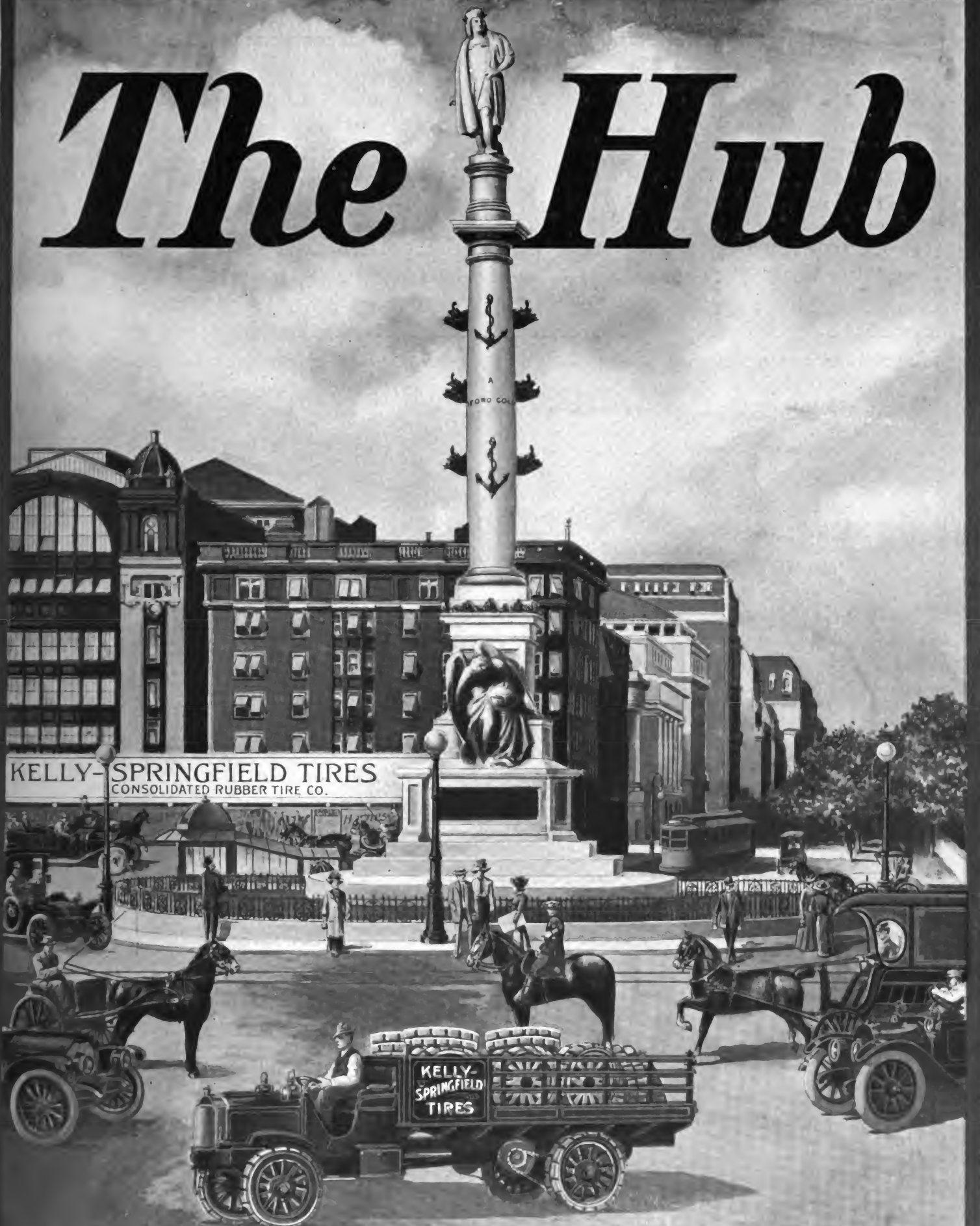
Cincinnati, Ohio

MERITAS LEATHER CLOTH

Looking for the best leather substitute at a low price?
See **MERITAS Leather Cloth** at your jobbers
Test it—crinkle it—it won't crack. Try some of it on a carriage or auto and note the service it gives.
Made in muslin, duck and drill, dull and glazed, smooth and grained, black and colors. Every carriage and auto manufacturer should write for sample books.
All good jobbers carry Meritas Leather Cloth

Standard Oil Cloth Co.
320 BROADWAY NEW YORK

The Hub



TRADE NEWS PUBLISHING COMPANY
24-26 MURRAY ST., NEW YORK

CURLY

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN
STAR or KENNY
Sweet Concealed Band
WOOD HUB
WARNER

WHEELS

HEAVY and LIGHT
for
CARRIAGES
WAGONS and
TRUCKS

IF YOU WANT THE BEST TRY OURS

SHELDON "TON-DON"

"THE AXLE THAT INSURES THE VEHICLE"

IT WEARS
and WEARS
and WEARS



MAKES THE
"GOING"
EASY

The spindles of the Sheldon "TON-DON" are so hard that a fine file makes no impression on them—yet the centers remain soft or "natural."

The boxes have linings of phosphor-bronze—a metal that grows smoother and more wear-resisting with use.

The next time you order a buggy write Sheldon "TON-DON" into your order. Then you will have a buggy fitted with axles that lighten the draft; axles that will run for years and show no signs of wear; axles that do not waste oil or run hot; axles that do not need constant attention.

SHELDON AXLE COMPANY,

Wilkes-Barre, Penna.



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

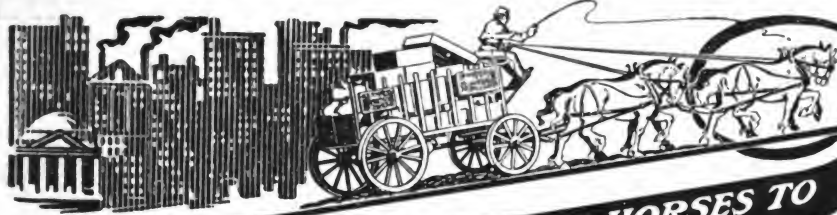
HICKORY NUT,  ACORN,  and STAR  BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO. RICHMOND, VA.

For Export Prices apply to the New York Office.



YOU CAN SET THESE 2 HORSES TO PULLING THIS NEW WAGON.

Most men would rather have two wagons using a horse apiece, than one wagon requiring two horses. You'd rather sell two wagons than one.

You can do this if you will induce customers to buy a wagon with

TIMKEN ROLLER BEARING AXLES

which reduce draft 50 per cent, allow one horse to do the work formerly needing two, or a light horse to replace a heavy one.

WAGONS with **TIMKEN ROLLER BEARING AXLES** pay a better profit than ordinary wagons, they build trade and hold it. They please wagon buyers because they pay 200 to 300 per cent a year by cutting feed, harness and shoeing bills in two.

Send for Catalog and Price Lists

The Timken Roller Bearing Co.
CANTON, OHIO

Branches:

68th & Broadway, New York.

1347 South Michigan Ave., Chicago.

The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Please mention "The Hub" when you write.

WHY STANDARDIZING AUTOMOBILE RIMS BENEFITS THE CAR BUILDER THE TIRE MAKER AND THE AUTO OWNER ALIKE

TO THE AUTOMOBILE MANUFACTURER

EVERY automobile manufacturer recognizes the absolute necessity of a universal rim—a rim which will fit all tires, so that any tire may be replaced at any time, anywhere. To him it is a thing of vital importance.

Such a result was accomplished by the formation of the **United Rim Company**. Over 96 per cent of the automobile manufacturers throughout the country have contracted with this company to supply their rims. To make a standard rim has involved the elimination of all features that prevent interchangeability and at the same time the retention of all features demanded by established engineering principles.

This standardization solves the perplexing problem that has so often confronted the manufacturer. "What is the best rim? What rim shall I adopt?"

UNITED RIMS incorporate the best features of the Continental, Goodyear, Diamond (Marsh) and Goodrich and are made by rim experts, where the knowledge of years of rim-building experience is welded into a universal type. Your cars are given prestige by the use of **UNITED RIMS**.

In a short time automobile buyers will insist that their ma-

chines are equipped with the **UNITED STANDARD UNIVERSAL RIMS**, because it means pleasure and economy in motoring, ease of tire changing and the ability to substitute any style of tire. All makes fit **UNITED RIMS**.

TO THE AUTOMOBILE TIRE MAKER

TIRE MANUFACTURERS will benefit by **UNITED STANDARDIZED UNIVERSAL RIMS**—the perfect rim—because tire trouble will be reduced—it will mean longer life tires—less trouble and more satisfied customers. Such tire makes as Goodyear, Diamond, Goodrich, United States Tires, etc., have contracted for **UNITED RIMS**. These manufacturers guarantee their tires when used on the **UNITED RIM**.

Think of the wonderful publicity these rims give your tires and the prestige that you secure by identifying your product with a rim that is standard, that incorporates all the best features of rim makes on the market. Over 96 per cent of the rims used in the country are **UNITED** make.

TO THE AUTOMOBILE OWNER

THE AUTO OWNER is the man who immediately recognizes the value of **STANDARDIZED UNIVERSAL RIMS**. He is eventually the fellow who is most vitally concerned, because he is the consumer and the rim has to make good with him to be successful.

UNITED RIMS represent 96 per cent of all the rims used in this country and incorporate every feature of the best rims heretofore made besides the years of experience gained in rim manufacture.

UNITED RIMS by their standardization obviate the predetermined rim that causes motorists so much trouble and reduces tire trouble and worry to its minimum. The **UNITED** fits any tire. This achievement is as important to the auto owner as the cylinders in your engine. It is one of the most signal steps yet taken toward tire satisfaction and economy.

Insist upon **UNITED RIMS**. Sold everywhere, or can be ordered direct from us. We can equip your car with **UNITED RIMS**, any style, any size. Send us the size of your wheels and tires. We will furnish you with the cost of making the change. Everything included you owe it to yourself to investigate.

Write For Descriptive Information

THE UNITED RIM COMPANY AKRON, OHIO.

Waterproof,
Sunproof,
Tough,

TRADE MARK

FABRIKOID

Greaseproof,
Durable,
Strong,

Costs Less and is Better Than Leather for Many Purposes
All Colors, Grains and Weights

Rapidly displacing leather for Buggy Tops - Auto and
Buggy Cushions - Backs - Auto Top Covers and Spare
Tire Cases - Buggy Boots - Lamp Covers - Storm Aprons

BIG BUSINESS FOR FABRIKOID

TRADE MARK

FABRIKOID LEATHER

AN IMPROVEMENT ON HIDE LEATHER FOR MANY PURPOSES

Costs less, no waste, water and vermin-proof, uniform strength and thickness FULLY
GUARANTEED, made in all grains and colors of hide leather, for upholstery, wall-
papering, automobile tops and cushions, screens, pillows, etc. Catalogue, samples,
prices and nearest dealer's name free.

FABRIKOID WORKS, Dept. No. 269

WILMINGTON, DEL.

E. I. DU PONT DE NEMOURS POWDER CO., Owner.

Over 10,000,000 CONSUMERS are reading the above advertisement. They are the
regular readers of the twenty-one high-class magazines in which the advertisement, the
first of a series of similar import, are appearing.

These people are going to use Fabrikoid because it has real merit and fills an actual need.
They will demand it of you.

Get posted on Fabrikoid - Write today for illustrated Fabrikoid Catalog No. 269. It
will be mailed promptly with full information, samples and prices. Address

FABRIKOID WORKS, Wilmington, Del.

(E. I. du Pont de Nemours Powder Company, Owner)



Do you keep a copy of this Catalogue within easy reach? If you want anything in the Vehicle Hardware Line look here for it first.

CARRIAGE


CLIPS
COUPLINGS
STAY BRACES
SHAFT IRONS
RUB IRONS
FIFTH WHEELS
STEPS
BODY LOOPS
HANGERS
SPRING BARS
TOE RAILS

TOP

BOW SOCKETS
TOP JOINTS
SHIFTING RAILS
ARM RAILS
LAZY BACK IRONS
CANOPY IRONS
GOOSE NECKS
TOP IRONS
PROP IRONS
STUMP JOINTS
PANEL IRONS

AUTOMOBILE

LEVERS
GEAR BLANKS
ROD AND YOKE ENDS
BODY IRONS
SOCKET IRONS
SPRING CLIPS
PEDAL PADS
LAMP BRACKETS
STEP HANGERS
BONNET LOCKS
MUD GUARD IRONS

The  stamp on your forgings for vehicles means that the best of quality and workmanship has been put into each article.

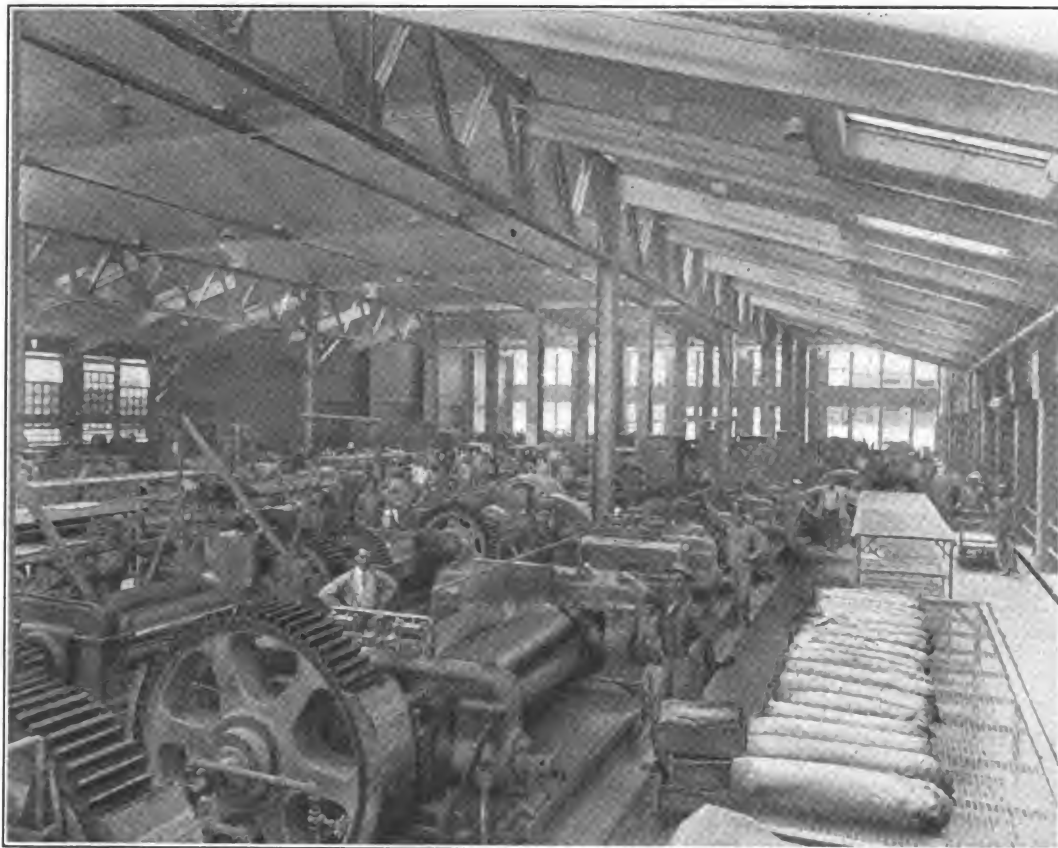
THE CLEVELAND HARDWARE COMPANY

CLEVELAND OHIO

Please mention "The Hub" when you write.

GOODRICH "SERVICE"

The Mill Room



Here the rubber is rolled or milled to give it proper consistency. This is the next step after the cleaning and drying of the crude. In other words, this picture shows the manufacture of rubber. Further on, the rubber is patterned into articles of sale, and cured.

This Department, representative of the equipment of the plant of the B. F. Goodrich Company, is the largest and most completely equipped Mill Room in the world.

The B. F. Goodrich Company

Akron, Ohio.

Write for This
Sample Book
and learn about
the Superior
Quality of



Meritas Leather Cloth

THE

LEADING LEATHER SUBSTITUTE

For Carriage and Automobile Trimmings.
Made in Three Grades

MUSLIN, DRILL AND DUCK

SMOOTH OR GRAINED
GLAZED OR DULL FINISHED

The Trade Mark is Stamped on the Back of Every
Piece and is a Guarantee of Perfect Quality.

STANDARD OIL CLOTH COMPANY

320 BROADWAY

NEW YORK

Please mention "The Hub" when you write.



**We Are in a Position to Entertain a
Portion of the Carriage
Builders During Their
Convention Week**

SHERWIN-WILLIAMS

The plan of S-W auto and carriage finishes is unity. We make every finish required for every operation from primers to finishing varnishes. Each finish is made exactly to fit the one following, which we believe is the only scientific way to be absolutely sure of building up the best possible work. We know the S-W method will fit your needs because it has been developed by practical finishers whom we employ as a part of our experimental and testing department to insure perfect results. The quality is the same that has distinguished Sherwin-Williams products for over forty years. Our list includes Primers, Fillers, Rough Stuff, Q.D. Colors, Color Varnishes, Rubbing and Finishing Varnishes, etc. We suggest that you write for prices and literature.

601 Canal Road, Cleveland, Ohio



COLORS AND VARNISHES



Please mention "The Hub" when you write.

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York, Chicago, Minneapolis, Kansas City

F. O. PIERCE COMPANY

NEW YORK, U. S. A.

Manufacturer of High Class Pigment Colors
from ORIGINAL FORMULAE. Colors ground in
Japan and other MEDIUMS to meet any
SYSTEM of APPLICATION

Our Latest Production UZATONA EXTRA LIGHT for Automobile Painting

Our Automobile Color Book just issued showing latest shades for this class of work
mailed upon application.

Please mention "The Hub" when you write.

MOLLER & SCHUMANN COMPANY

COLORED RUBBING

Most perfect as to working, drying and wearing.

CARRIAGE & AUTO VARNISHES

Send for color card and descriptive price list.

Chicago Branch - 110 N. Desplaines St., Office and Factory - BROOKLYN, N. Y.

DOUGLAS & LOMASON CO., INC.

MANUFACTURERS OF

Carriage and Sleigh Rails

ETCHED NAME PLATES
and

HARDWARE SPECIALTIES



Our New Factory, Brooklyn Ave. and M. C. R. R.
DETROIT, MICHIGAN

TRADE **VALENTINE** MARK
ISHES

The Quickest Of All Painting Systems

For Automobiles and Carriages, Four Days from
the wood to the perfectly finished job. Nothing
like it for rush work or crowded shops.

Especially valuable in hot humid weather.

Materials of Valentine Quality.

Write us for our remarkable offer of a trial lot of our

CELOX FOUR-DAY SYSTEM

to be sent you at our risk absolutely.

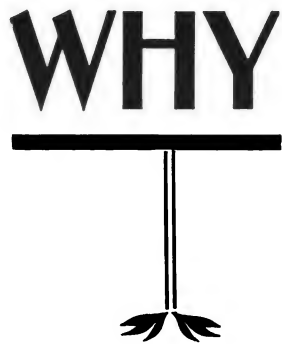
Simply sign the coupon, and send to nearest branch.

VALENTINE & COMPANY

New York Chicago Boston Toronto

(4 day)
Name.....
Address.....
Town.....
State.....
Cut off & mail to
Valentine &
Company

Please mention "The Hub" when you write.



ARE THE

WILLEY**SPECIALTIES**

used in all the principal carriage building factories, the majority of the custom and repair shops, and the motor vehicle shops generally

**BECAUSE OF THEIR TRIPLE STANDARD****QUALITY****ECONOMY****UTILITY****SPECIALTIES**

that have displaced the "out-of-date" lead and oil method:

ECLIPSE PRIMING OIL,
PREPARED FILLER FOR GEARS,
SMOOTHING-UP COAT,
PREPARATION or SURFACE COAT,
GROUND COLORS FOR SEMI-
TRANSPARENT GLOSS COLORS,
"ELASTICGLOSS" COLORS.

because of their usefulness to the painter and economy to the consumer.

**LEADERS-not followers**

We demonstrate the advanced and up-to-date method of

SURFACING METAL

We accomplish richer and more beautiful color effects with our **ELASTICGLOSS COLORS**, and deepen and enrich these with our specially mixed **Glaze Coats**.

C. A. Willey Company

MANUFACTURER EXCLUSIVELY

**Specialties in Carriage, Automobile and Passenger Car
Paints, Colors and High Grade Varnishes**

HUNTER'S POINT, NEW YORK CITY, N. Y., U. S. A.

Please mention "The Hub" when you write.

L. C. CHASE & CO.

MANUFACTURERS OF

Automobile and Carriage Top Materials

BOSTON

89 Franklin St.

NEW YORK

321 Fourth Ave.

WRITE FOR SAMPLES

CHICAGO

19 So. Fifth Ave.

SAN FRANCISCO

360 Fremont St.

**Fine Chase Rubber
and
Chase Leather
Coated Fabrics in
Single and Double
Texture**



**Mackintosh Cloths
for Tops and
Slip Covers in Pure
Mohairs, Lustres,
Cravenettes,
Twills, etc.**

WHERE CHASE FABRICS ARE MADE

ALL COATING AND PROOFING DONE IN OUR OWN MILLS

CARRIAGE AND WAGON MATERIALS AUTOMOBILE HARDWARE TRIMMINGS

JOHN A. GIFFORD & SON

[24 Murray St.
25 Park Place]

NEW YORK CITY

**A FULL AND COMPLETE STOCK ALWAYS ON HAND
OVER FIFTY YEARS EXPERIENCE IN EXECUTING ORDERS
FOR DOMESTIC AND FOREIGN MARKETS.**

Please mention "The Hub" when you write.

PROTEKTOL

The Modern Paint Reducer

If PROTEKTOL had been known before linseed oil, the linseed oil salesmen would have a hard time convincing users of PROTEKTOL that linseed oil is "just as good."

70 Cents per Gallon.

Write For Descriptive Booklet

Branches:

New York, Philadelphia
Buffalo, Toronto
Montreal, Buenos Aires

THE AULT & WIBORG CO.
VARNISH WORKS
CINCINNATI.

Branches:

Chicago, St. Louis.
Minneapolis, San Francisco
Mexico City, London, Eng.



THE INDIANAPOLIS DASH COMPANY

Manufacturers of High Grade

DASHES AND FENDERS

ALSO ROLL-UP-STRAPS

AND PROPS BLOCK WASHERS

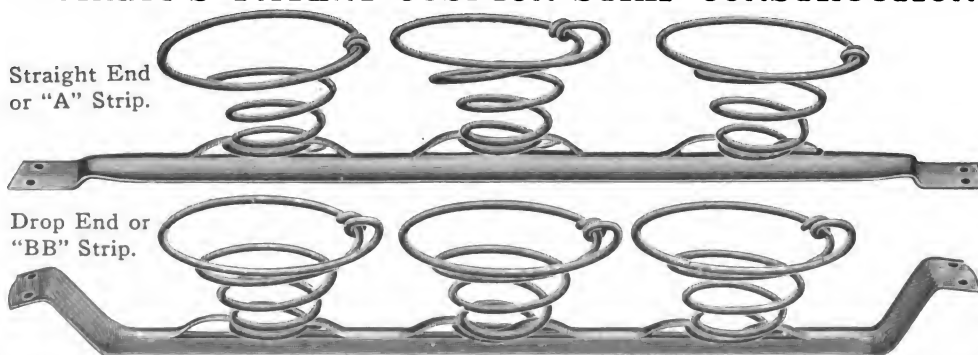
INDIANAPOLIS,

INDIANA.

MURRAY'S PATENT CUSHION STRIP CONSTRUCTION

We sell 90% of the carriage trade 15,000,000 sold in the last ten years. That is going some.

The reason—
Price— Quality—
Quick Shipments.



We can take care of a few more contracts but you must hurry. We also manufacture special auto constructions. Write for details. Are you a customer?

MANUFACTURED BY THE WM. A. MURRAY SPRING CO., CINCINNATI, OHIO

Please mention "The Hub" when you write.

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

SEPTEMBER, 1911.

No. 6.

The Anniversary Convention Issue of The Hub

Is Noteworthy for a Remarkable Illustrated Display of New Vehicles Contributed by
All the Leaders of the Trade. An Achievement that will Command Attention.

THE STYLE PORTFOLIO.

It has become a custom to signalize meetings of the Carriage Builders' National Association by specially prepared issues of the journals identified with the life of the trade.

This is a deserved honor to the oldest commercial organization that is leading an active life.

The Hub has endeavored to make a worthy departure from the usual lines. Its effort has not had as its prime object the honor and glory of the publication, but has kept steadfastly to the thought that its work should be for the benefit as well as the entertainment of everyone whose spirit as well as whose interest is absorbed by the welfare and progress of the whole vehicle industry.

To those who have so liberally contributed the best examples of the work they are building praise should be accorded for the public spirit shown. It might be inferred that this sentiment is a chauvinistic expression, but analysis will show it is not the fact.

Builders are not prone to show competing builders all they are making. Sometimes they will not exchange catalogues. It is, therefore, a really altruistic spirit that has caused nearly a hundred of the cream of the vehicle trade to contribute for our use. The Hub is deeply sensible of the compliment paid to it and believes it is doing a good work in presenting to the trade both here and abroad this splendid collection of nearly 500 vehicles of range so wide that it is representative.

Of course it is well understood by all who will examine our Style Portfolio that it is made up of what is known as "whole-sale" work—those who make for the dealer who passes it on to the customer—the vehicle owner. This work to-day represents the major part of our vehicle output. The individual builder who builds for the consumer on direct order is growing smaller by degrees until he has become almost negligible as a trade factor.

An analysis of style leads the observer to a conclusion that the evolution of the vehicle has a determined tendency to confine itself to defined types whose variations are slight. Either the best type for its purpose has been evolved, or the stress of competition has been at the expense of the mind in creating new forms. This observation is true right down the list. We infer it must be brought about by certain restrictions due to competition.

We instance the so-named automobile buggy seat. It will be found on examination that most of the builders present forms of it on the jobs contributed for illustration. The lines differ slightly, but the type is constant. We can only suppose the demand from customers has compelled some example of this type. And that of itself is curious because it is not a comfortable design from the point of view of the passenger, and it must therefore be set down to a fad or a fancy that will run its course.

The evolution of the buggy as it is known in America is an instance of the excellence that is an outcome of concentration of effort on a particular form. Its superior for its purpose is nowhere to be found. In fact in all the degrees of "light work" we are very happy in design and have supplied the type for appreciative imitators everywhere in the world.

As to the automobiles shown it can only be a comparison of examples of the same type. Style evolution here is in its childhood, and, of course, all babies look about alike. We hope for a distinct differentiation as the builder begins to get weary of the sameness, and takes it upon himself to give play to his talents as a draftsman. There surely is scope for it. We look for this new era hopefully when the horse-drawn vehicle builder becomes weaned from the thought that there is any excuse for his not entering into this department of his art with the same skill and confidence he shows in the horse-drawn vehicle industry.

But aside from any of the foregoing considerations, the fact is patent and stands out like a lighthouse that our exposition of vehicle styles in this September issue is a distinct achievement of enterprise and energy that we are confident will be estimated at its worth.

The Style Portfolio will be an annual event of The Hub and plans are now being made to conduct the future numbers on an improved and higher standard. It is the purpose to make it so complete that as an album of styles it will become an authority and reference book. The need of a compendium of this nature is apparent and its trade value recognized. It means the interest and co-operation of the builders and makers, and with this it would speak in unmeasured terms of the aggressive and modern purposes of those engaged in vehicle construction for a better and higher condition in styles; stimulating initiative and originality; and the whole a splendid reflex on the thrifty and advanced condition of the industry represented.

CONVENTION ANNOUNCEMENT OF THE CARRIAGE BUILDERS' NATIONAL ASSOCIATION

THE INVITATION TO ALL.

The Carriage Builders' National Association extends to the Carriage, Wagon and Sleigh Builders of the United States a cordial invitation to attend the Thirty-ninth Annual Convention of their Association at Atlantic City, N. J., September 25-29th of this year.

A visit to the Convention and Exhibition of the materials used in the construction of your productions and in your business, and a few days spent by the sea in that delightful city cannot help being of benefit to you.

The Association will be happy to see you and you will be welcome whether a member or not. The Convention and Exhibition are free to every Vehicle Builder, as our sole purpose is to benefit all builders of vehicles.

By Order of the Association,

HENRY C. McLEAR, Secretary.

PROGRAM BY DAYS

FIRST DAY.

Tuesday, September 26th, at 10 A. M.

It is the desire of the president and the association that the proceedings should open promptly at the hour named.

And to this session all the ladies visiting the convention are most cordially invited.

The meeting will be called to order by the president, Charles J. Richter, of New York.

Address of welcome by the Hon. Harry Wootten, City Solicitor of Atlantic City, N. J.

Address by Mr. A. T. Bell, Atlantic City, N. J.

Response on behalf of the Association by Mr. J. D. Dort, Flint, Mich.

Opening address by the president, Mr. Charles J. Richter.

Report of Executive Committee, Mr. Charles A. Lancaster, Merimac, Mass., chairman.

Nomination of president for the ensuing year.

Appointment of the Committee on Resolutions.

Appointment of the Committee to Recommend Officers for the ensuing year.

Appointment of the Committee on the Exhibition.

Appointment of the Obituary Committee.

On this Tuesday evening, September 26th, the reception to the members and ladies will be at the Marlborough-Blenheim, from 8 to 10 o'clock. All members and the ladies attending the convention are invited to be present.

SECOND DAY.

Wednesday, September 27th, at 10 A. M.

Meeting will be called to order by the President.

Report of the Secretary and Treasurer.

Address by Mr. E. C. Mulcey, Philadelphia, Pa., "Electricity as Related to the Vehicle Industry."

Report of the Committee on Good Roads, Mr. Maurice Connolly, Dubuque, Iowa, chairman.

Report of the Trustees of the Technical School, Mr. Charles J. Richter, chairman.

Address by Mr. P. R. Doherty, Flint, Mich., on "The Future of the Carriage Industry."

Report of the Committee on New Members, Fred. C. Nuetzel, Louisville, Ky., chairman.

Report of the Committee on Credits and Terms, Mr. W. H. Roninger, St. Louis, Mo., chairman.

Report of the Committee on Patents, Mr. John F. Galvin, New York, chairman.

Report of the Committee to Recommend Officers for the ensuing year.

Election of President.

THIRD DAY.

Thursday, September 28th, at 10 A. M.

Meeting will be called to order by the President.

Report of the Committee on Costs, Mr. Otto Armleder, Cincinnati, Ohio, chairman.

Address by Mr. C. H. E. Redding, "Can More Buggies Be Sold by Advertising?"

Report of the Committee on the Conservation of the Resources of the Country, Mr. Henry Rattermann, Cincinnati, O., chairman.

Report of the Committee on the Abuses in the Carriage and Accessory Trades, Mr. Perrin P. Hunter, Cincinnati, O., chairman.

Report of the Committee on Freight and Classification, Mr. Theodore Luth, Cincinnati, Ohio, chairman.

Consideration of the Report of the Executive Committee.

Unfinished business.

New business.

Election of officers.

Report of the Committee on Resolutions.

Report of the Committee on Exhibition.

Report of the Obituary Committee.

Selection of a place for the next convention.

Adjournment.

ANNUAL BANQUET

MARLBOROUGH-BLENHEIM

Thursday, September 28, at 7 o'clock P. M.

Tickets for the banquet can be obtained from the secretary at Atlantic City, N. J.

At the annual convention, held in New York, October 9, 1907, a resolution was passed "that the secretary be required to charge for all extra tickets the cost of the same per plate." As this banquet will cost slightly over \$7 per plate, the extra tickets will be \$7 per ticket.

This does not concern the members' own tickets, as they are all entitled to one ticket free. Only applies to the extra tickets any one may wish to have. Please note this so there will be no misunderstanding.

For the accommodation of the members of the association the secretary will be at the Exhibition Hall on the afternoons of Tuesday, Wednesday and Thursday, September 26, 27 and 28, from 2 until 5 o'clock, for the reception of new members, giving out banquet tickets, and such other business as may be required of him. The members are earnestly requested to procure their banquet tickets as early as possible, so that we can tell who will be present at the dinner.

To prevent mistakes and misunderstandings, the Executive

Committee has adopted the following rule: Members of the association who desire their representatives to use their banquet tickets must give an order for the same in writing to the secretary.

SPECIAL NOTICE.

The attention of members is particularly called to the excellence of the program for these meetings, and to the prominence of the speakers secured to deliver the addresses. Each one of the gentlemen who are to speak on the interesting subjects assigned them is an expert in his line, and the subjects are of vital importance to all. No one will fail to be instructed and gain practical knowledge that will be of benefit to him. Your presence is most earnestly desired.

Business Meetings and Exhibition.

Both the business meetings and the exhibition will be held on Young's Million Dollar Pier, Atlantic City.

The Reception.

The annual reception will be held on Tuesday evening, September 26, at the Marlborough-Blenheim, from 8 to 10 o'clock.

The Banquet.

The annual banquet will be held at the Marlborough-Blenheim Thursday evening, September 28th, at seven o'clock.

Letters to the Secretary.

As the secretary has to be in Atlantic City some days before the convention dates, all letters to him requiring an answer should be mailed so they will reach him at Mt. Vernon, N. Y., on or before September 17.

The admission to the Pier will be by the Association Badge, which will be given each member on his registration, and to all vehicle builders visiting the Exhibition.

As every one going on the Pier must pay an admission, and as the Association Badge will admit you free of any cost, you will see the importance of registering and securing your badge on your arrival in Atlantic City.

The registry book will be at the entrance to the Pier from Friday, the 22nd until Friday the 29th, from 8 A. M. to 5 P. M. Don't fail to register at once.

After September 18th, the address of the secretary will be the Marlborough-Blenheim, Atlantic City, N. J., until after the convention. By order of the Executive Committee,

HENRY C. McLEAR., Secretary.

C. H. A. T. IN ATLANTIC CITY.

Celebrating its twenty-first anniversary of life as an association, the Carriage, Harness and Accessory Travelers' Association are planning to have a great time the week of September 25 at Atlantic City. The Board of Directors met recently and arranged to hold their annual convention on September 25 at 8 P. M. in the club room of the Marlborough-Blenheim Hotel.

On Wednesday night, September 27, the C. H. A. T. will give a "shore dinner" at Soulas & Lindig's New Inlet Hotel. This is one of the famous places for this sort of a feast and it will be a night when the manufacturers and travelers will come together for a good time.

President George W. Huston has been very active in building up the membership, and Secretary Jesse L. Nelson reports the finances in good shape.

The Board of Directors spent considerable time in going over the employment bureau plan of the Association, and wish it known to manufacturers that the secretary is in a position to recommend good travelers to them at any time.

This feature of the C. H. A. T. will be greatly enlarged on at the Atlantic City convention.

From present prospects Atlantic City will be the mecca for the carriage, harness and accessory trades the week of September 25, and as all travelers in these lines are eligible to membership, application should be sent to Jesse L. Nelson, Boston, Mass., accompanied by the dues of one dollar for one year.

The benefits are many at a small cost. Help make the twenty-first anniversary a "hummer." The nineteen living ex-presidents of the C. H. A. T. will hold a re-union during the week.

THE ACCESSORIES INTRODUCE A NEW FEATURE.

The Accessory Trades' Association, which figures to a liberal extent as host of the entertainment features at C. B. N. A. conventions, has heretofore held itself in reserve until about Friday of convention week before deploying the good time that should be especially considered as coming from them.

This year at Atlantic City a new departure, very graceful and courteous, will be shown in the nature of an exclusive treat for the ladies.

A banquet will be spread in the Marlborough-Blenheim on Thursday evening at the same time the mere men are dining, and the ladies will be invited, as Whitman has it, "to invite their souls" and make merry with the hearty compliments and good will of the Accessories whose guests they will be.

This ought to be a very enjoyable event, and we are sure it will be.

In other cities it was customary to treat the ladies to a theatre party on that night, but now they will have their own "spread," and we hope a toastmistress and speeches and all the scenery that goes with these formal affairs.

TECHNICAL SCHOOL FOR DRAFTSMEN.

Andrew F. Johnson, instructor-in-chief of the Technical School for Carriage Draftsmen and Mechanics has issued the Fall prospectus. We give some account of the good things offered the ambitious, studious young man who wants to make something of himself.

The school was founded and has been carried on by the Carriage Builders' National Association during the past thirty-one years. It was opened in 1880 as an evening class only. The correspondence school was established in 1883, and the day school in 1892.

Its home is in the Mechanics Institute, a fine building devoted to educational purposes and located at 20 West 44th street, New York City.

The School is to teach men to design vehicles, and to make working drawings and fashion plates of the same, and only those men employed in carriage, wagon or automobile building, or some of the accessory trades are admitted to its privileges. Fall term opens on the last Monday in September and closes for the Christmas holidays. Winter term opens on January 3, and closes on April 8, 1912. Instruction is free. The correspondence school is open the year round. Instruction in this department costs five dollars per term or fifteen dollars for the full course of three terms.

The day class is in session every weekday, except Saturday, during the term, from 9:30 o'clock A. M. to 4:30 o'clock P. M. Evening class from 7:30 to 9:30 P. M., Monday, Wednesday and Friday during the term.

Applicants for admission to the day and evening classes must be able to read and write English, and must have a good knowledge of arithmetic. All employes of the carriage and accessory trades are admitted to the correspondence school without examination.

Ninety per cent of the graduates are holding good positions in the carriage and automobile trade, and the demand for men trained in the school is constantly increasing.

Students in the Technical School for Carriage Draftsmen and Mechanics may, if they choose, take up studies other than those taught in this school, such as the study of engine details, drafting of gasoline engines, electrical work, mathematics, etc. These classes are conducted in the same building and the instruction is free. A special circular of information may be had upon application. For details as to courses of study in the Technical School for Carriage Draftsmen and Mechanics, address Andrew F. Johnson, 20 W. 44th street, New York City.

WHAT OF THE FUTURE? OPINIONS

BUGGIES AND AUTOS.

Monte L. Green.

A retrospection of 25 years in the buggy business shows many changes, but a careful analysis of the conditions that have prevailed from time to time and to which many concerns have been subjected fails in any way to prove that the industry is not a stable one and will not so continue in and out of season for the years to come.

The concerns which continue to fit themselves into the changing phases will survive—those who survive will be fitted to meet the vicissitudes that are sure to arise and the survival of the fittest will be a never-changing rule that is without exception and which time has proved.

To fit one's self into the many changing angles of the body vehicular means changing a line of styles to changing locations. There is little sentiment in dropping a particular line of work that has proved unsalable or unprofitable and there should be no more, if it means transplanting to a point nearer a new or better market. There will always be buggies used, there will always be factories to sell them. Who and where? That's a different story, and only the enterprising and progressive will be able to tell it.

The auto vehicle business promises to be one of the most important and most permanent of our branches of industry. They are a necessity of our modern business and social life, and as the years go on they are constructed to meet the wants of all countries and all classes, to do the work of all trades, professions and callings, and the annual sales will record far greater numbers placed in service than there were in the year 1910.

The autos in future years will be made even better than they are to-day and will be sold at far lower prices than they are commanding, and at the same time they will yield reasonable profits to the manufacturers. The rapid progress being made in the standardization of the various types of the auto vehicles, both in motor trucks and automobiles, will enable manufacturers to reduce their cost to themselves and their prices to the public. The public demand will be continuous, and, like it was with the sewing machine and the machines used in agricultural work, while the demand in the United States will show no decrease the demand in foreign countries will be much greater.

Years of energetic selling and vastly profitable manufacturing of sewing machines have but created a demand that never seems to lessen. Years of turning out annually thousands upon thousands of agricultural tools have but introduced them to the world's users, and even at this day prices cause complaint of excessive earnings by the manufacturers. The sales go on however and the manufacturers prosper.

As the autos fit into the usages and needs of the people, as it becomes plain to all that they are adapted for the purposes desired, the demand for them is certain to increase, not to grow less, and the profit in them will encourage the manufacturers to strive in every way to meet and fill the wants of the public for such vehicles.

BUSINESS AS GEO. DELKER CO. SEES IT.

Carl P. Schlamp.

Business with us has been very good indeed, and we have a considerable increase over any previous year. We regard the prospect for the manufacturer of light horse-drawn vehicles to be as good as ever. The capacity of the factories is equal to what it has been at any time, although there have been numerous changes, and many concerns have gone out of business in certain sections. There have been accessions in other territory, however, that fully cover this loss.

The general prospects for the horse-drawn light vehicle busi-

ness are good. The automobile has had no appreciable effect upon it. This, we think, is due to the fact that some method of ready transportation is necessary to every farmer, and all social intercourse in rural localities requires such transportation. Automobiles are expensive to start with, and more expensive to keep in order, and require a great deal of time to keep them in running order. They are not within the means of the ordinary farmer or his sons, each of whom must have some method of personal transportation.

The only expense to the farmer in keeping a buggy or run-about is that of the vehicle and harness, and occasional repairs. He has the horse from necessity for use in his farming operations, and the same animal is used at night or on Sunday for visiting, and for trips of a business nature.

With these facts before us we cannot believe that the demand for light horse-drawn vehicles will ever become less in the agricultural sections, which take more than ninety per cent of the entire product. In cities doubtless the matter is very different, but it has no material effect upon the business.

VIEWS OF ANOTHER PROMINENT CONCERN.

C. S. Walker.

Our business is running about the same and practically on a level with last year. There has been some decrease in this section in the purchase of automobiles, but to what extent could not say, but should think that the business was twenty-five per cent off from over two years ago. We think this is general through the Central West.

Our opinion as to the future for the horse-drawn vehicle is that it was never brighter. Horses here are in brisk demand at good prices and on a general count of vehicles which passed the writer's home a few Sundays ago, horse-drawn vehicles were slightly ahead of automobiles in numbers. Do not believe this was true a year ago.

PARRY BUSTLING AS USUAL.

S. C. Parry.

The present business is an average for the season, that is to say, the present volume of orders compares favorably with like periods of former years.

We have pinned our faith on the continued use of the horse-drawn vehicle, and up to this time nothing in the use of such has caused our faith to waver, and our faith has been repaid by as large a volume of business during the past year as we have ever enjoyed.

Both generally and locally the use of the auto is undoubtedly increasing, but in many instances the user is one that never was the user of a horse-drawn vehicle and probably never would be.

As a whole we feel much encouraged for an increased business in our line of manufacture.

HUGHES BUGGY CO. SATISFIED.

Ed. Hughes.

We are pleased to report that business with us at this time is very good, and as every year that we have been in business has shown an increase, therefore, at this time it is the best season we have ever enjoyed.

Our business has not been interfered with in any way by the automobile, and would not be in our immediate section if we were manufacturers of vehicles of high grade, as this is a very hilly country.

He who buys a popular priced vehicle is not affected by the automobile in any sense. This is true of our section of the United States and the market from which we receive the bulk of our orders.

THE HUB STYLE PORTFOLIO

LIST OF CONTRIBUTORS

Adams Bros. Co., Findlay, O.
Ahlbrand Carriage Co., Seymour, Ind.
American Motors Co., Indianapolis, Ind.
Ames-Dean Carriage Co., Jackson, Mich.
Anchor Buggy Co., Cincinnati, O.
Auburn Automobile Co., Auburn, Ind.
Avery Co., Peoria, Ill.
Bowling Green Motor Car Co., Bowling Green, O.
W. N. Brockway, Homer, N. Y.
S. E. Baily & Co., Lancaster, Pa.
S. R. Bailey & Co., Amesbury, Mass.
Brown Carriage Co., Cincinnati, O.
Brookshire & Robinson, Saint Paris, O.
Buckeye Mfg. Co., Anderson, Ind.
Cass Motor Truck Co., Port Huron, Mich.
Chalmers Motor Co., Detroit, Mich.
Colby Motor Co., Mason City, Ia.
Columbus Buggy Co., Columbus, O.
Colonial Carriage Co., Circleville, O.
Commercial Truck Co. of America, Philadelphia, Pa.
Connersville Buggy Co., Connersville, Ind.
John Deere Plow Co., St. Louis, Mo.
Delker Bro's Buggy Co., Henderson Ky.
Durant-Dort Carriage Co., Flint, Mich.
Duryea Auto Co., Saginaw, Mich.
Eagle Carriage Co., Cincinnati, O.
Emerson Carriage Co., Rockford, Ill.
Eufaula Buggy Co., Eufaula, Ala.
Findlay Motor Co., Findlay, O.
Franklin Automobile Co., Syracuse, N. Y.
Gaylord Motor Car Co., Gaylord, Mich.
Geneva Wagon Co., Geneva, N. Y.
Gerstenslager Co., Worcester, O.
Grabowsky Power Wagon Co., Detroit, Mich.
Great Western Automobile Co., Peru, Ind.
Hackney Bros., Wilson, N. C.
Hercules Buggy Co., Evansville, Ind.
High Point Buggy Co., High Point, N. C.
Hull Vehicle Mfg. Co., Savannah, Ga.
Hughes Buggy Co., Lynchburg, Va.
Jackson Automobile Co., Jackson, Mich.
Janesville Carriage Works, Janesville, Wis.
Kearns Motor Car Co., Beavertown, Pa.
King Motor Car Co., Detroit, Mich.
Knox Automobile Co., Springfield, Mass.
LaPorte Carriage Co., LaPorte, Ind.

Ligonier Carriage Co., Ligonier, Ind.
Lion Buggy Co., Cincinnati, O.
Lion Motor Car Co., Adrian, Mich.
Lozier Motor Co., Detroit, Mich.
Lull Carriage Co., Kalamazoo, Mich.
Mais Motor Truck Co., Indianapolis, Ind.
Marshalltown Buggy Co., Marshalltown, Ia.
McFarlan Motor Car Co., Connersville, Ind.
W. H. McIntyre Co., Auburn, Ind.
Milburn Wagon Co., Toledo, O.
Moline Automobile Co., East Moline, Ill.
Jos. W. Moon Buggy Co., St. Louis, Mo.
H. A. Moyer, Syracuse, N. Y.
Nordyke & Marmon Co., Indianapolis, Ind.
Ohio Valley Buggy Co., Aurora, Ind.
Ohio Motor Car Co., Cincinnati, O.
Oxford Buggy Co., Oxford, N. C.
Packard Motor Car Co., Detroit, Mich.
Parry Mfg. Co., Indianapolis, Ind.
C. R. Patterson & Sons, Greenfield, O.
Peabody Buggy Co., Fostoria, O.
Peters Buggy Co., Columbus, Ohio.
Peerless Motor Car Co., Cleveland, Ohio.
Premier Motor Mfg. Co., Indianapolis, Ind.
Prouty & Glass Carriage Co., Wayne, Mich.
Pullman Motor Car Co., York, Pa.
Queen City Carriage Co., Cincinnati, O.
Rapid Motor Vehicle Co., Pontiac, Mich.
Ratterman & Luth, Cincinnati, O.
Regal Buggy Co., St. Louis, Mo.
Regal Motor Car Co., Detroit, Mich.
Rex Buggy Co., Connersville, Ind.
Sayers & Scovill, Cincinnati, O.
Staver Carriage Co., Chicago, Ill.
Seidel Buggy Co., Richmond, Ind.
Sechler & Co., Cincinnati, O.
South Georgia Buggy Co., Valdosta, Ga.
Speedwell Motor Car Co., Dayton, O.
Storm Queen Buggy Co., Wabash, Ind.
Studebaker Corporation, South Bend, Ind.
Sullivan Bros., Rochester, N. Y.
Velie Carriage Co., Moline, Ill.
Waverly Co., Indianapolis, Ind.
Winton Motor Car Co., Cleveland, O.
Winkler Bros. Mfg. Co., South Bend, Ind.
Zimmerman Mfg. Co., Auburn, Ind.

SEPTEMBER, 1911

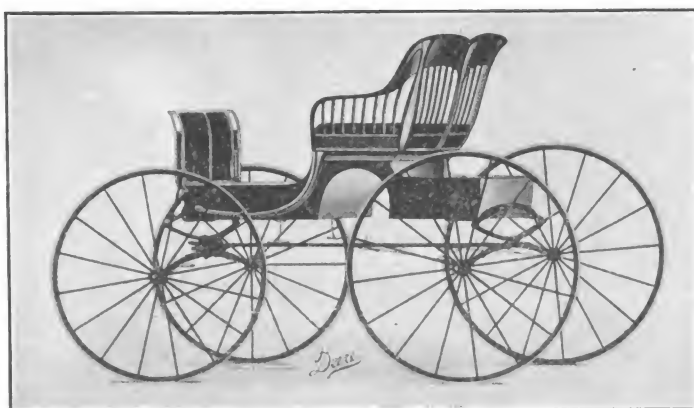
OPEN BUGGIES



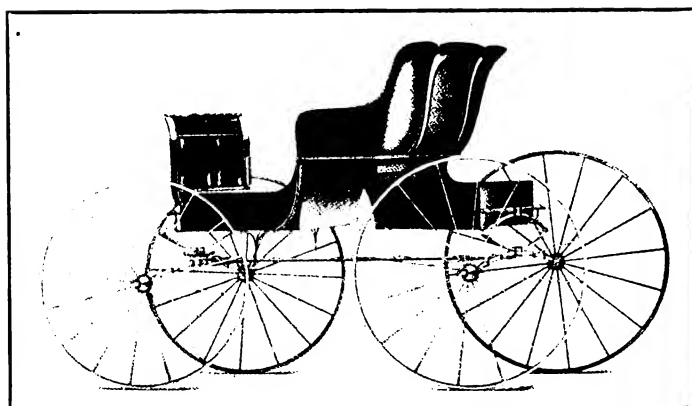
SOUTH GEORGIA BUGGY CO.
Valdosta, Ga.



DELKER BROS. BUGGY CO.
Henderson, Ky.



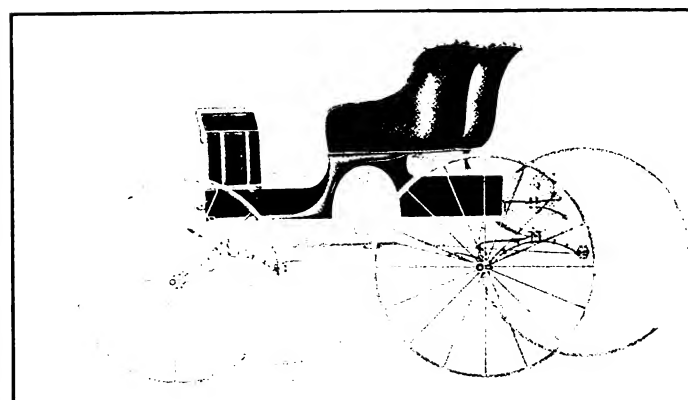
JOHN DEERE PLOW CO.
St. Louis, Mo.



EMERSON CARRIAGE CO.
Rockford, Ill.



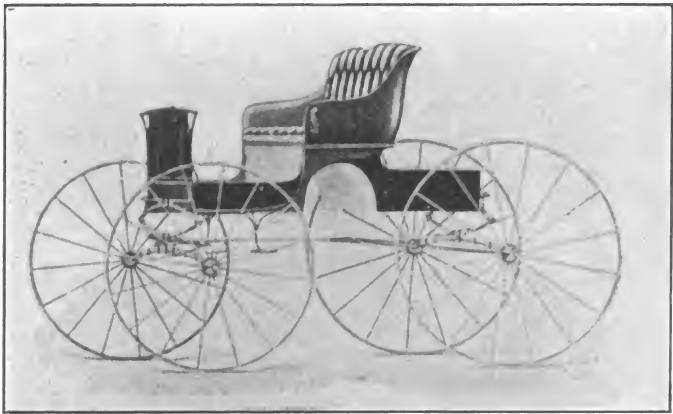
REGAL BUGGY CO.
St. Louis, Mo.



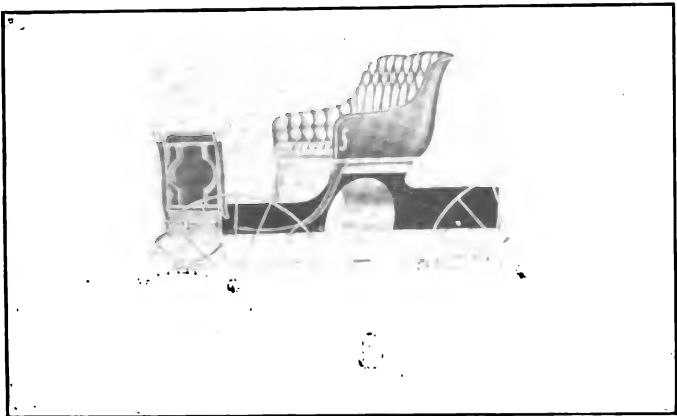
HUGHES BUGGY CO.
Lynchburg, Va.



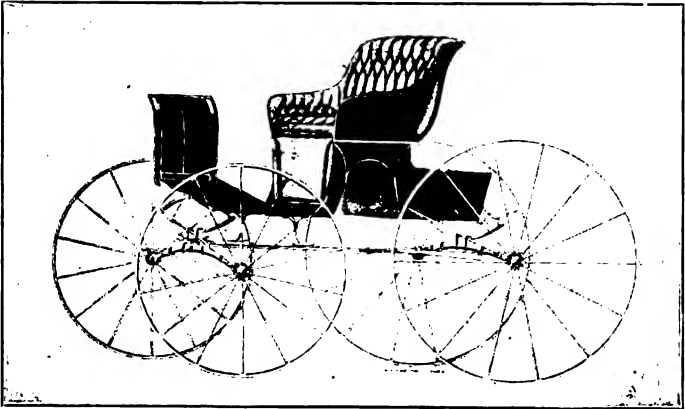
PARRY MANUFACTURING CO.
Indianapolis, Ind.



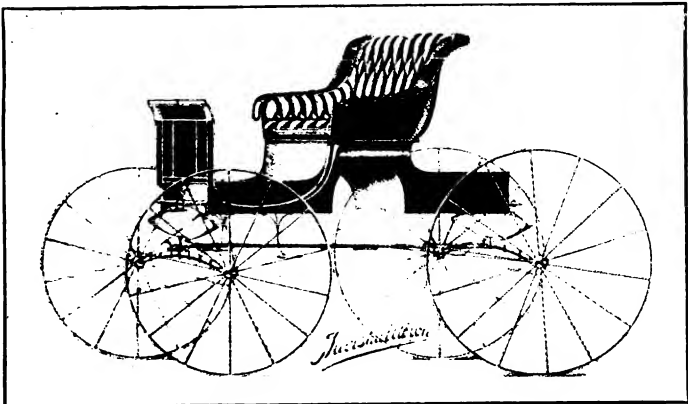
DURANT-DORT CARRIAGE CO.
Flint, Mich.



OXFORD BUGGY CO.
Oxford, N. C.



HULL VEHICLE MFG. CO.
Savannah, Ga.



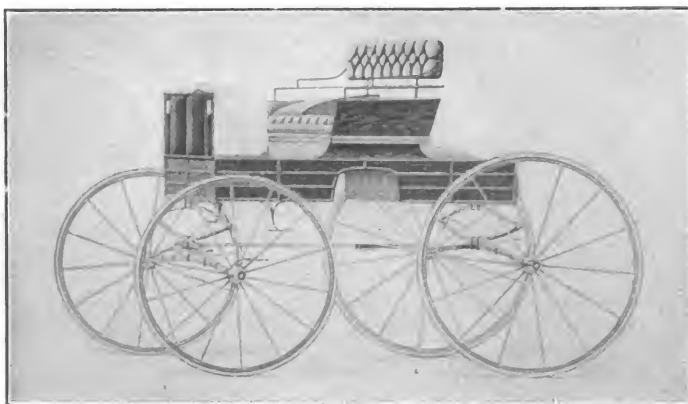
MARSHALLTOWN BUGGY CO.
Marshalltown, Iowa



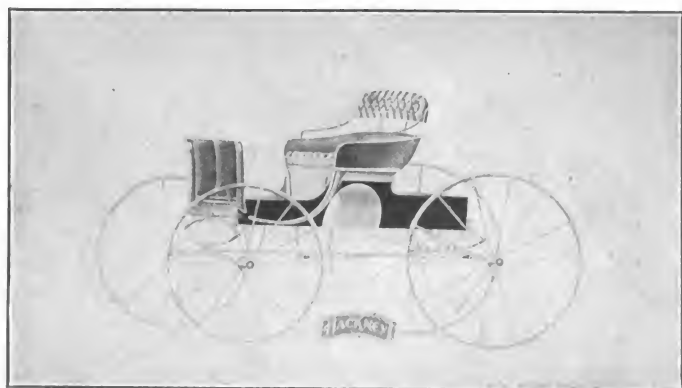
RATTERMAN & LUTH
Cincinnati, Ohio



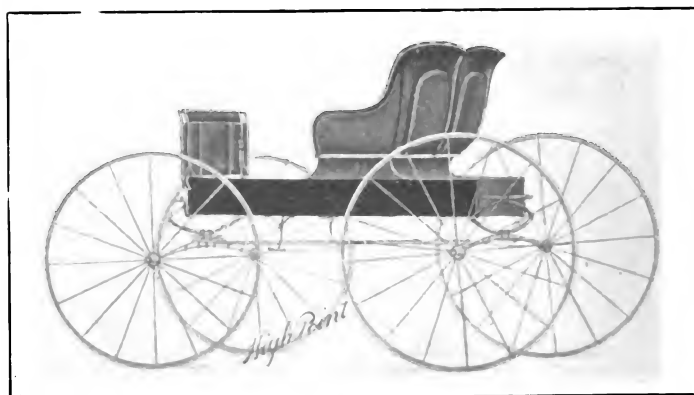
HERCULES BUGGY CO.
Evansville, Ind.



SECHLER & CO.
Cincinnati, Ohio



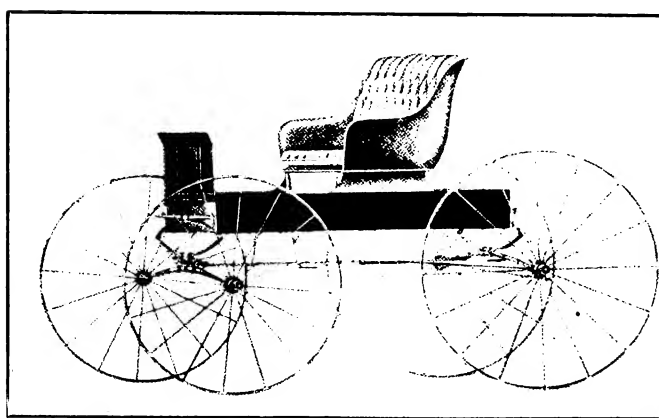
HACKNEY BROS.
Wilson, N. C.



HIGH POINT BUGGY CO.
High Point, N. C.



RATTERMAN & LUTH
Cincinnati, Ohio



STUDEBAKER CORPORATION
South Bend, Ind.



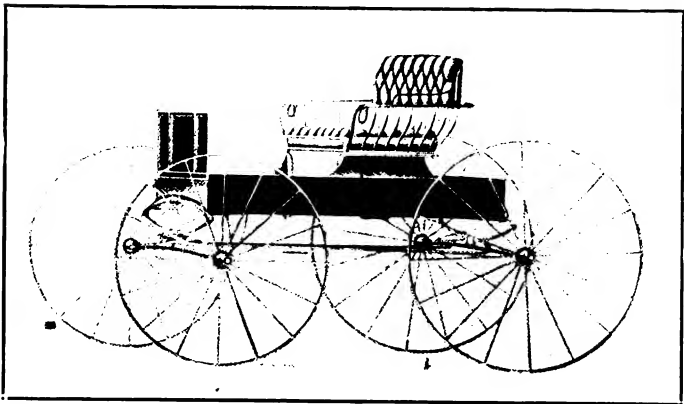
AHLBRAND CARRIAGE CO.
Seymour, Ind.



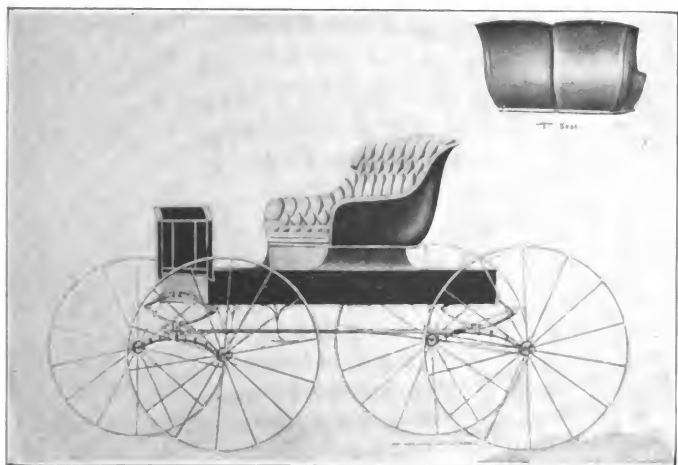
RATTERMAN & LUTH
Cincinnati, Ohio



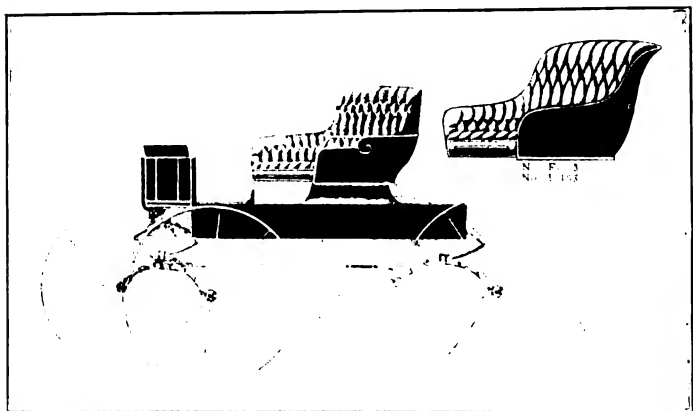
STAVEL CARRIAGE CO.
Chicago, Ill.



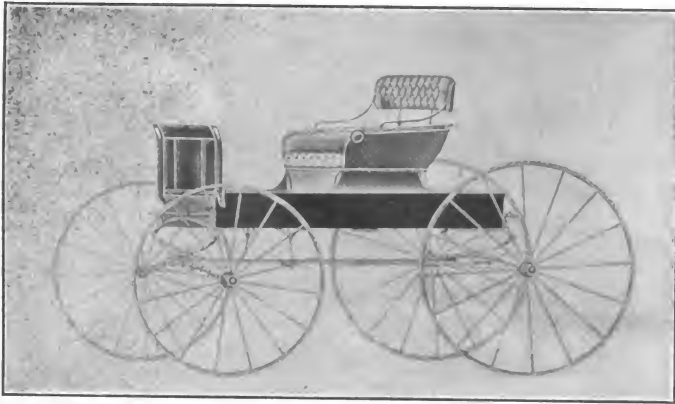
HUGHES BUGGY CO.
Lynchburg, Va.



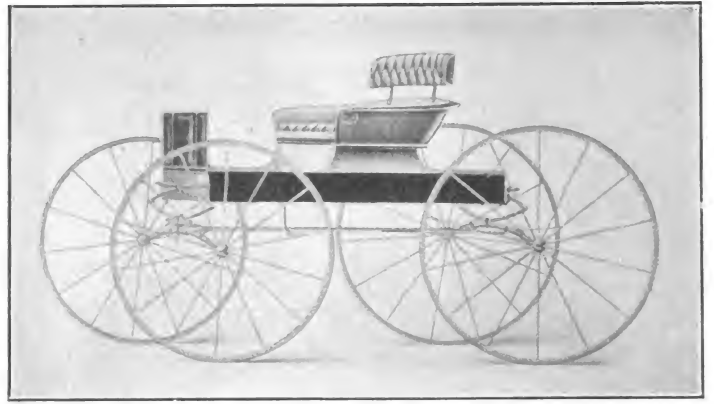
STAVEL CARRIAGE CO.
Chicago, Ill.



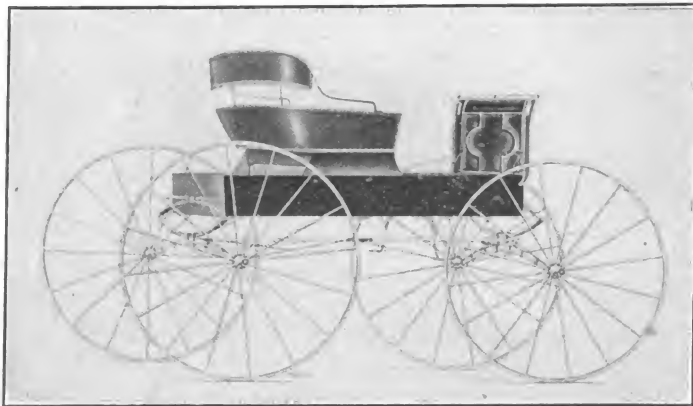
HULL VEHICLE MFG. CO.
Savannah, Ga.



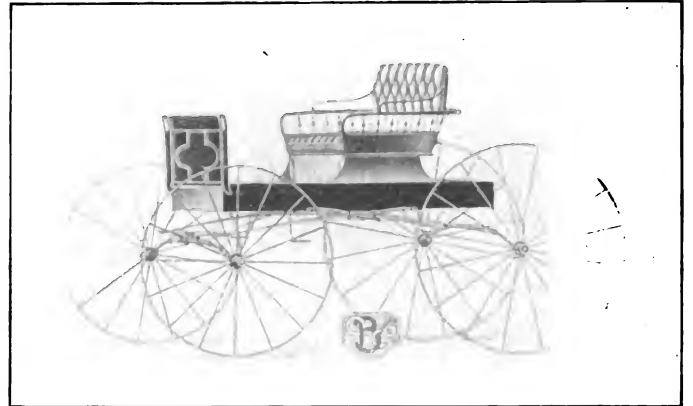
AHLBRAND CARRIAGE CO.
Seymour, Ind.



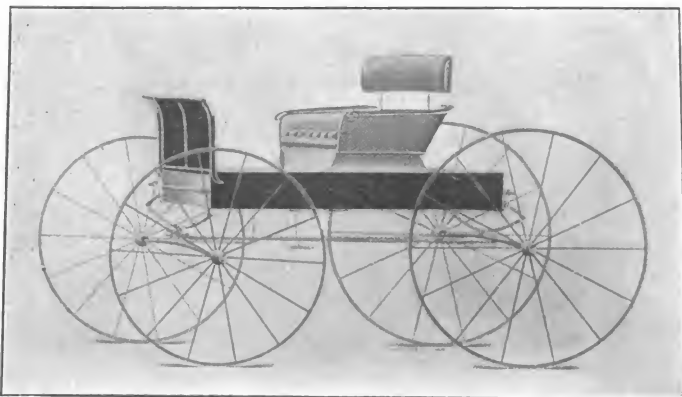
PETERS BUGGY CO.
Columbus, Ohio



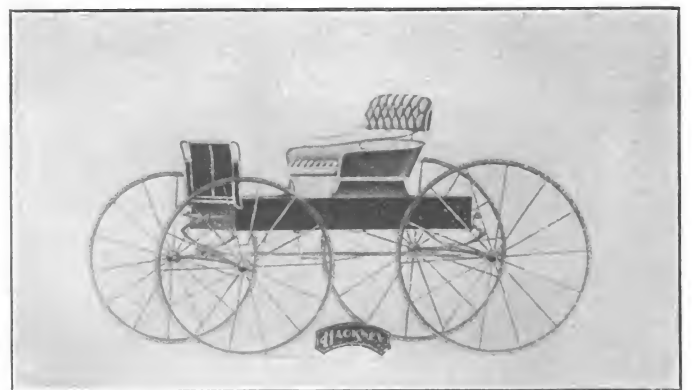
OHIO VALLEY BUGGY CO.
Aurora, Ind.



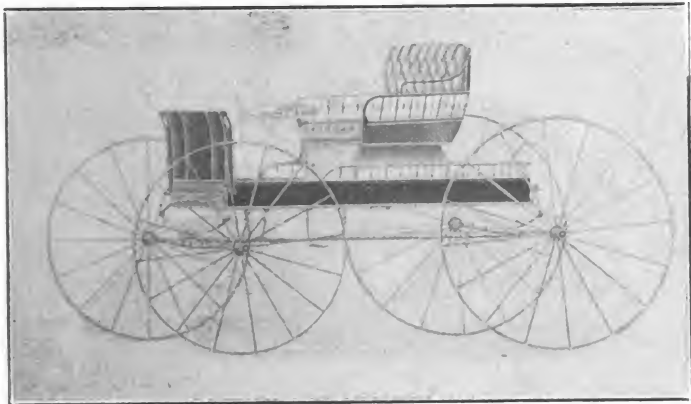
OXFORD BUGGY CO.
Oxford, N. C.



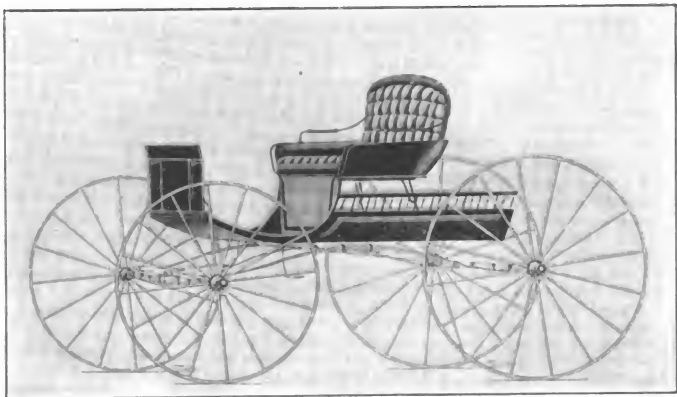
COLUMBUS BUGGY Co.
Columbus, Ohio



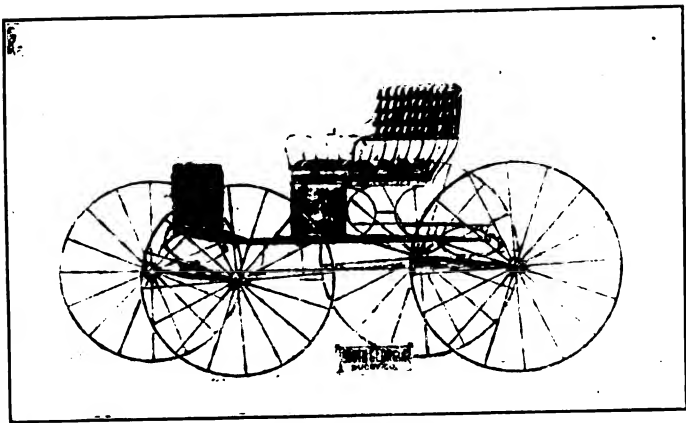
HACKNEY BROS.
Wilson, N. C.



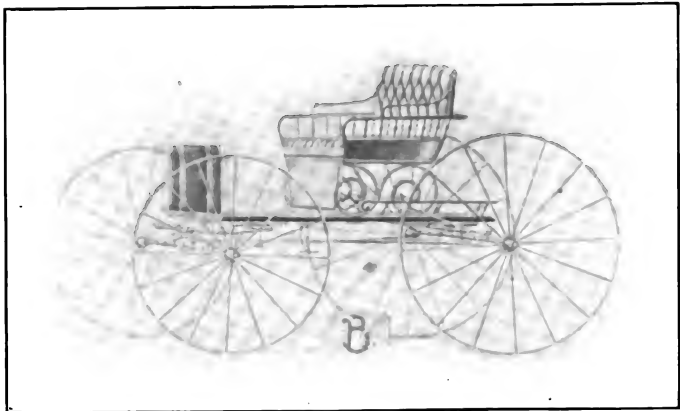
HUGHES BUGGY CO.
Lynchburg, Va.



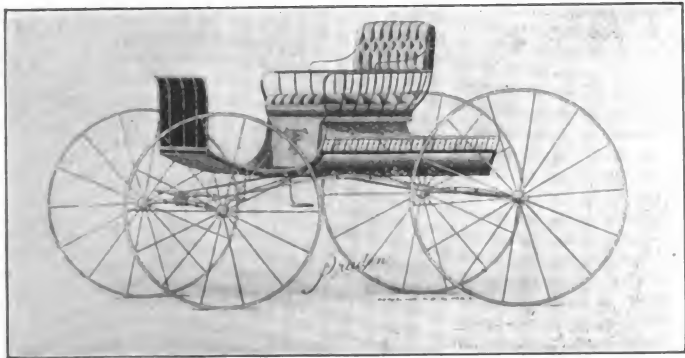
PARRY MANUFACTURING CO.
Indianapolis, Ind.



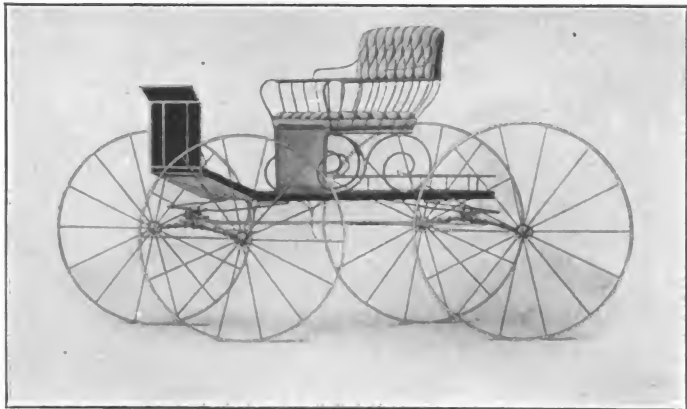
SOUTH GEORGIA BUGGY CO.
Valdosta, Ga.



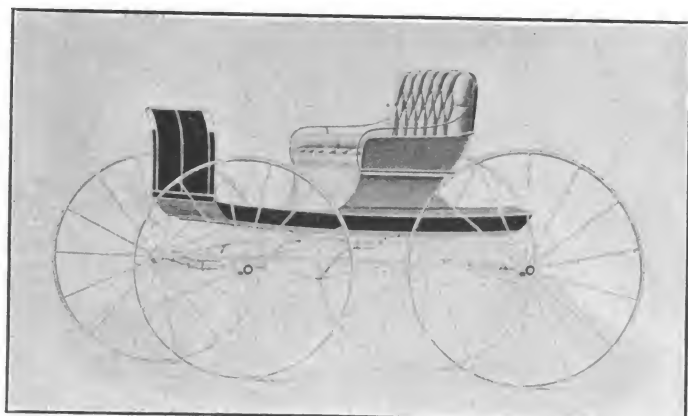
OXFORD BUGGY CO.
Oxford, N. C.



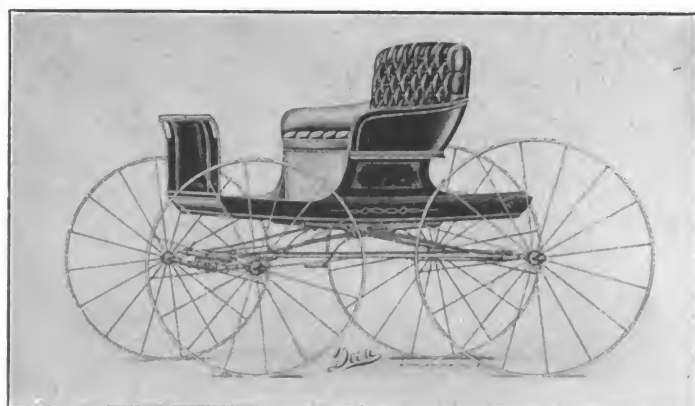
EUFULA BUGGY CO.
Eufaula, Ala.



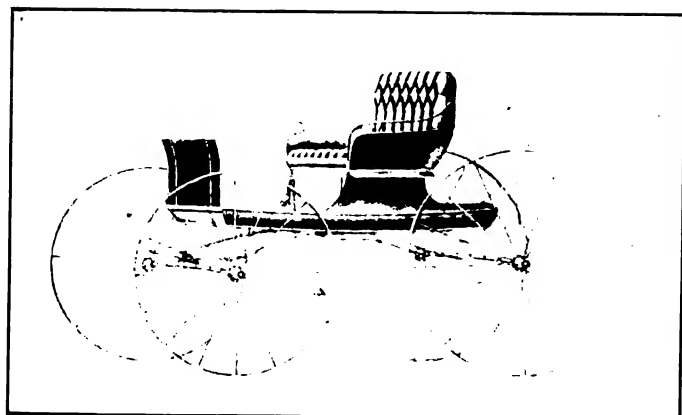
LION BUGGY CO.
Cincinnati, Ohio



AMES-DEAN CARRIAGE CO.
Jackson, Mich.



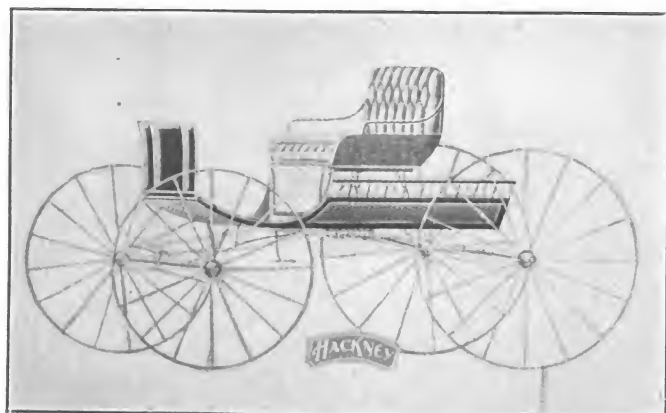
JOHN DEERE PLOW CO.
St. Louis, Mo.



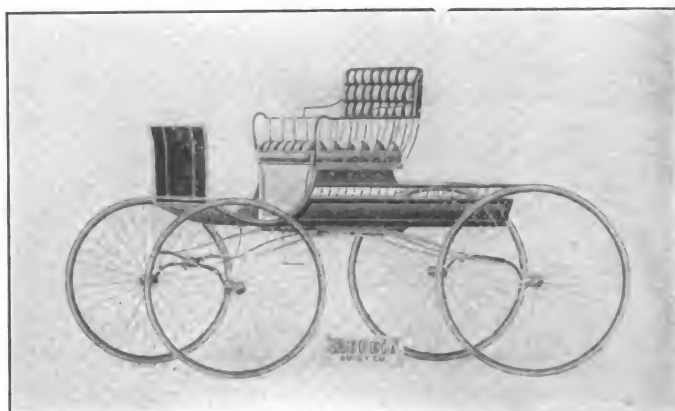
OXFORD BUGGY CO.
Oxford, N. C.



RATTERMAN & LUTH
Cincinnati, Ohio



HACKNEY BROS.
Wilson, N. C.



SOUTH GEORGIA BUGGY CO.
Valdosta, Ga.

TOP BUGGIES



REGAL BUGGY CO.
St. Louis, Mo.



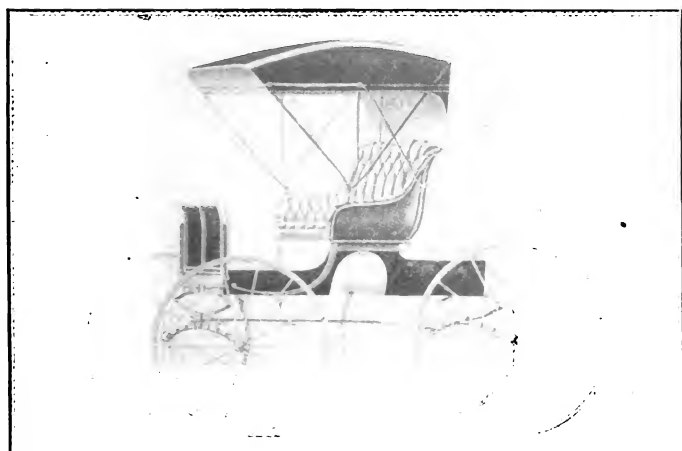
PARRY MANUFACTURING CO.
Indianapolis, Ind.



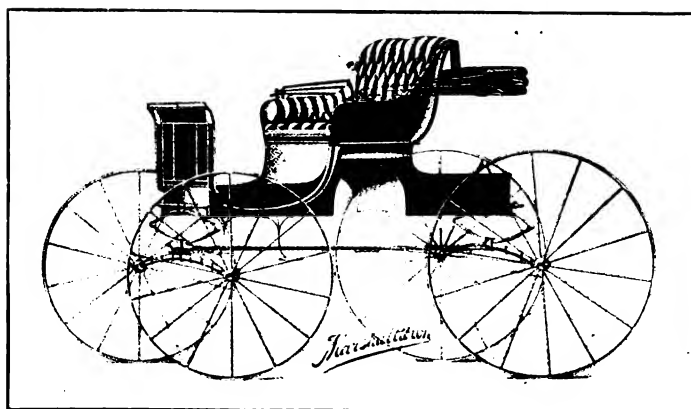
JOHN DEERE PLOW CO.
St. Louis, Mo.



STAVAR CARRIAGE CO.
Chicago, Ill.



PETERS BUGGY CO.
Columbus, Ohio



MARSHALLTOWN BUGGY CO.
Marshalltown, Iowa



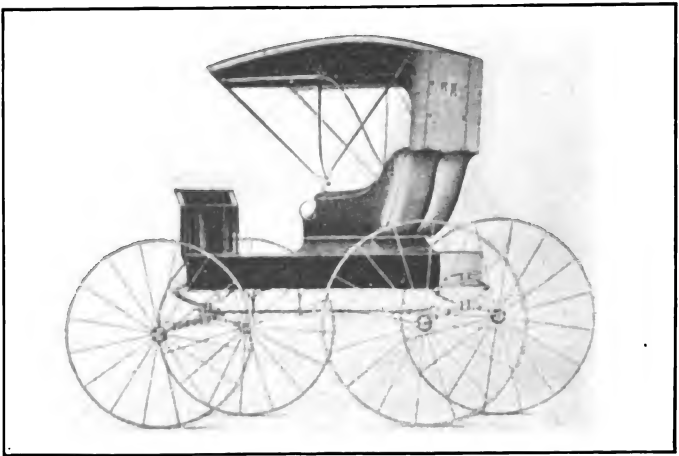
DURANT-DORT CARRIAGE CO.
Flint, Mich.



DURANT-DORT CARRIAGE CO.
Flint, Mich.



LA PORTE CARRIAGE CO.
LaPorte, Ind.



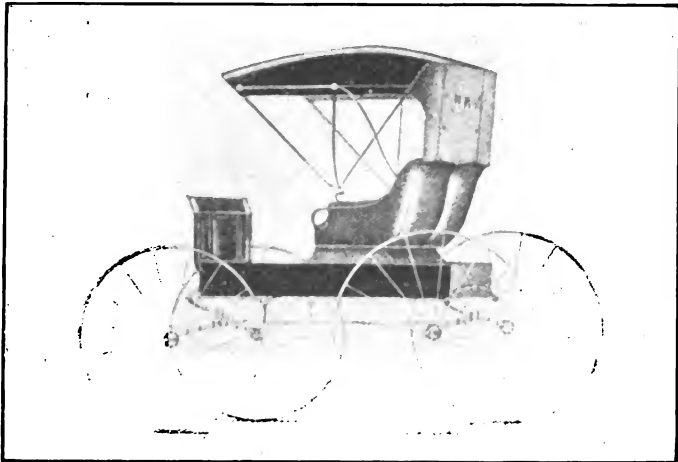
DURANT-DORT CARRIAGE CO.
Flint, Mich.



AHLBRAND CARRIAGE CO.
Seymour, Ind.



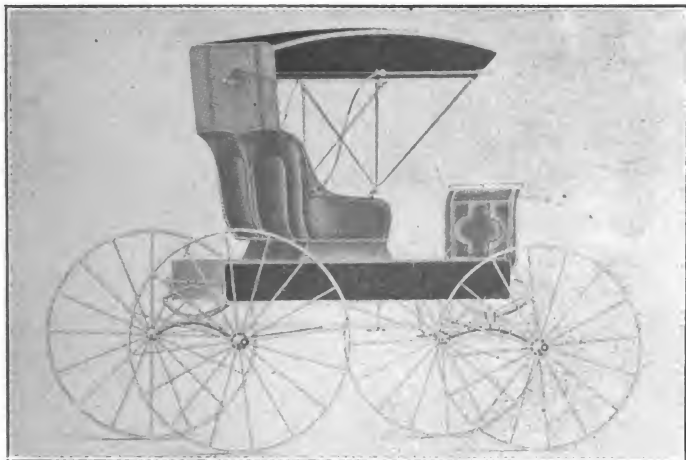
EMERSON CARRIAGE CO.
Rockford, Ill.



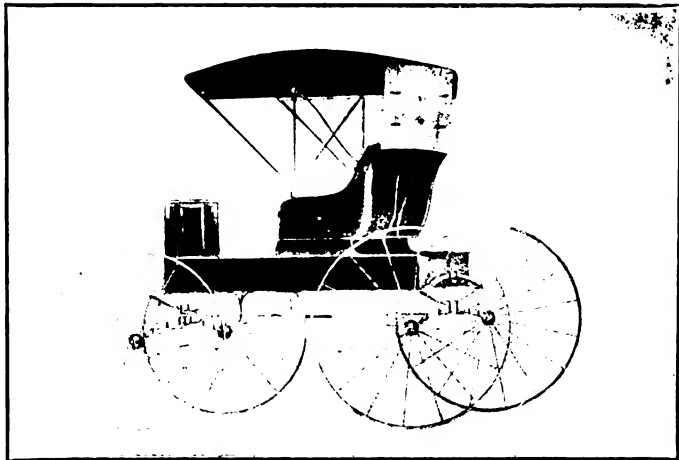
DURANT-DORT CARRIAGE CO.
Flint, Mich.



DELKER BROS. BUGGY CO.
Henderson, Ky.



OHIO VALLEY BUGGY CO.
Aurora, Ind.



ZIMMERMAN MFG. CO
Auburn, Ind.



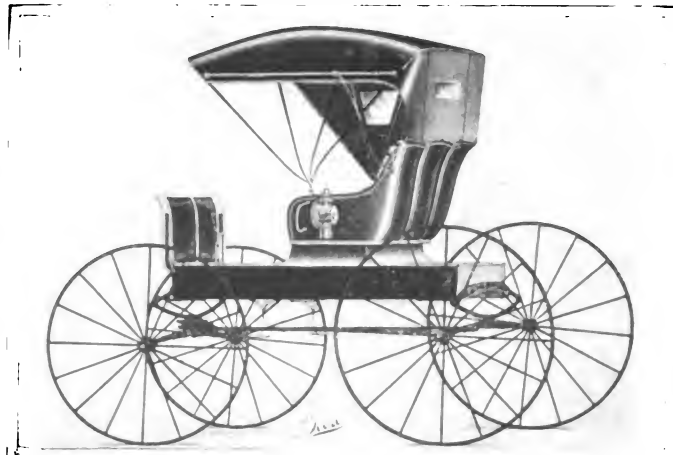
VELIE CARRIAGE CO.
Moline, Ill.



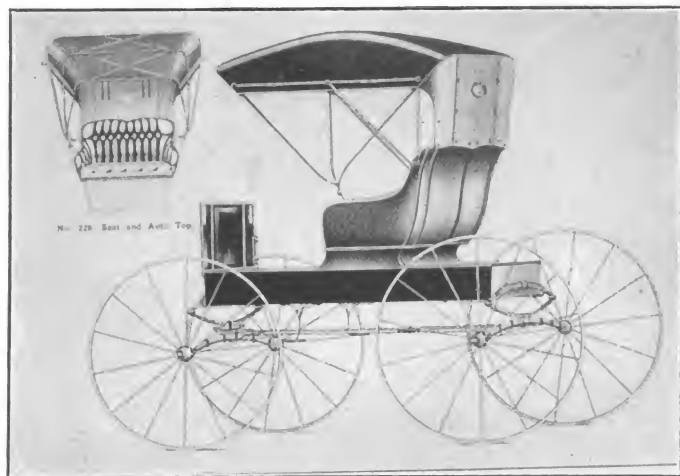
PARRY MANUFACTURING CO.
Indianapolis, Ind.



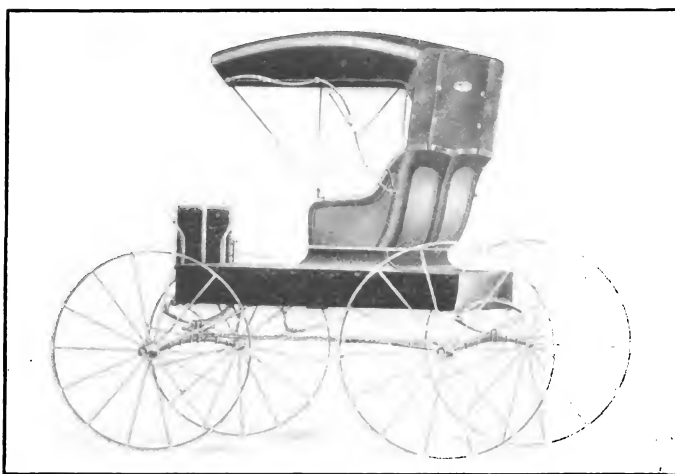
DURANT-DORT CARRIAGE CO.
Flint, Mich.



JOHN DEERE PLOW CO.
St. Louis, Mo.



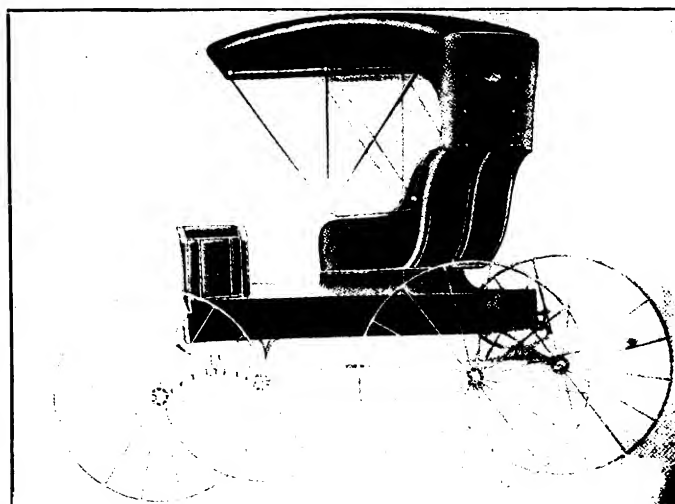
STAYER CARRIAGE CO.
Chicago, Ill.



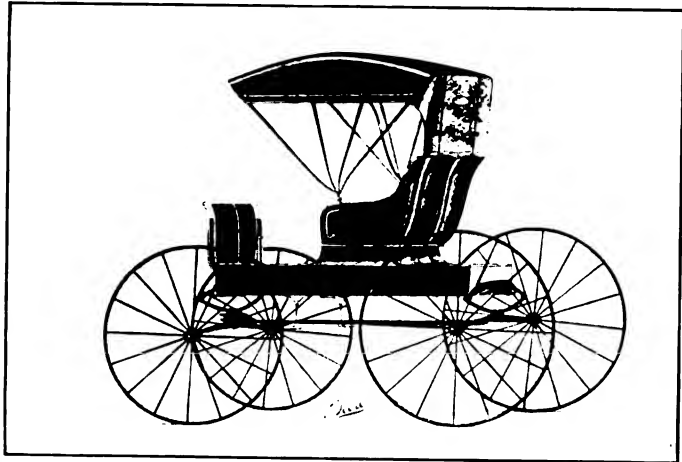
AMES-DEAN CARRIAGE CO.
Jackson, Mich.



SAYERS & SCOVILL
Cincinnati, Ohio



JOS. W. MOON BUGGY CO.
St. Louis, Mo.



JOHN DEERE PLOW CO.
St. Louis, Mo.



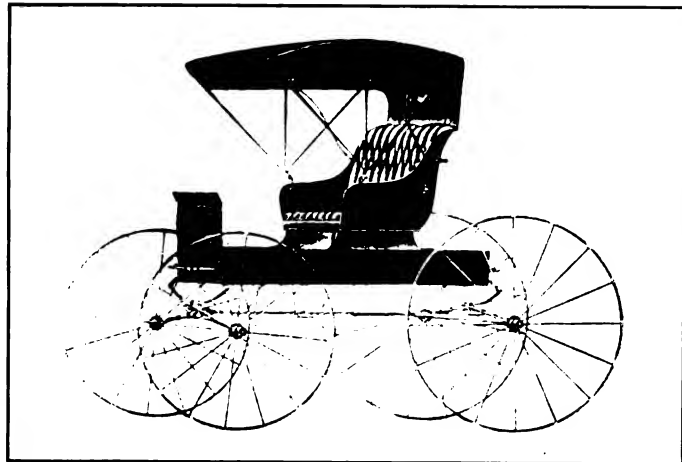
AHLBRAND CARRIAGE CO.
Seymour, Ind.



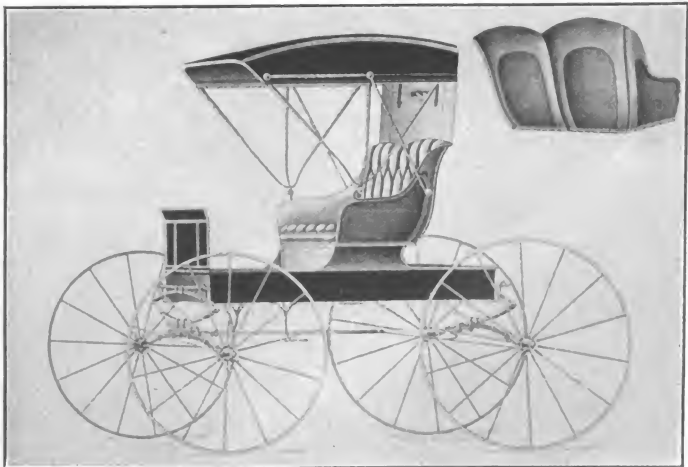
REGAL BUGGY CO.
St. Louis, Mo.



JOHN DEERE PLOW CO.
St. Louis, Mo.



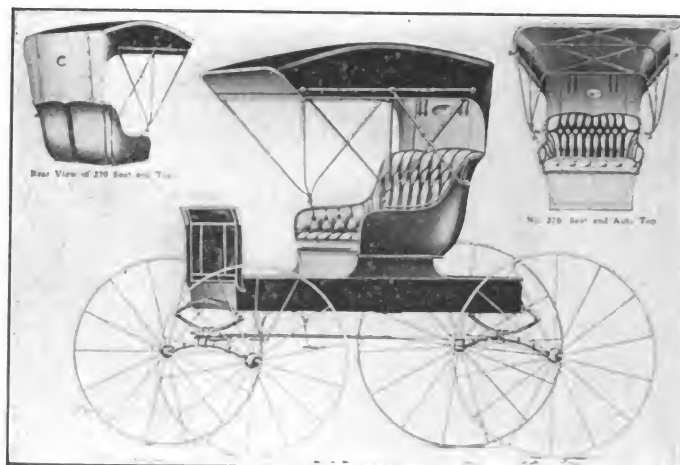
STUDEBAKER CORPORATION
South Bend, Ind.



CONNERSVILLE BUGGY CO.
Connersville, Ind.



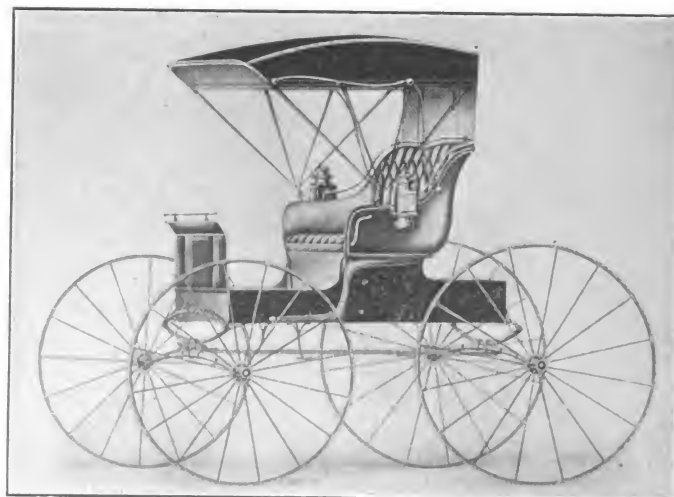
VELIE CARRIAGE CO.
Moline, Ill.



STAVEL CARRIAGE CO.
Chicago, Ill.



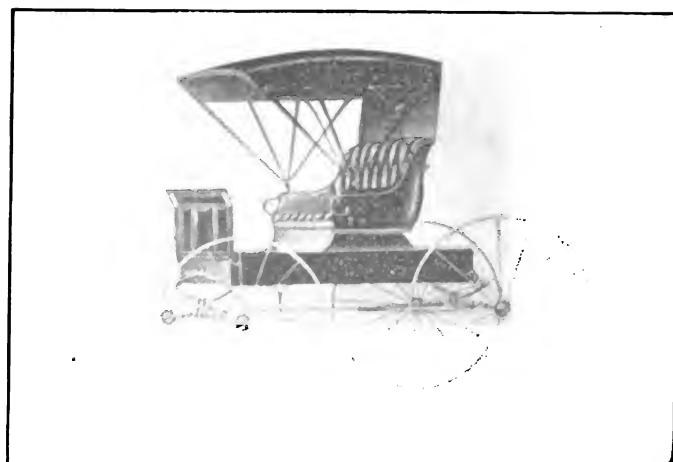
AHLBRAND CARRIAGE CO.
Seymour, Ind.



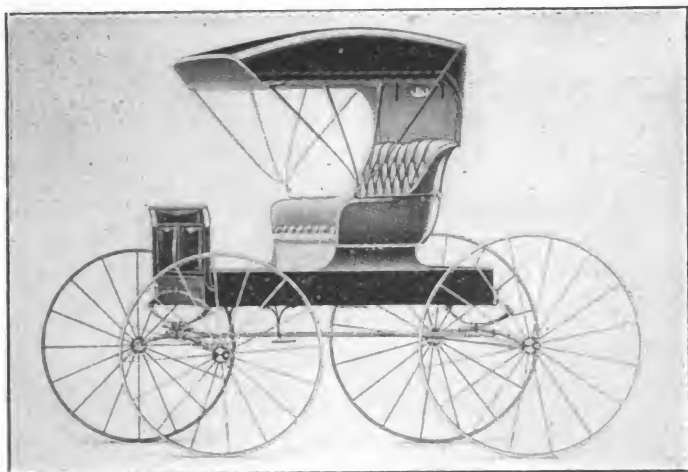
ANCHOR BUGGY CO.
Cincinnati, Ohio



HERCULES BUGGY CO.
Evansville, Ind.



DURANT-DORT CARRIAGE CO.
Flint, Mich.



EMERSON CARRIAGE CO.
Rockford, Ill.



STAVES CARRIAGE CO.
Chicago, Ill.



DURANT-DORT CARRIAGE CO.
Flint, Mich.



MARSHALLTOWN BUGGY CO.
Marshalltown, Iowa



RATTERMAN & LUTH
Cincinnati, Ohio



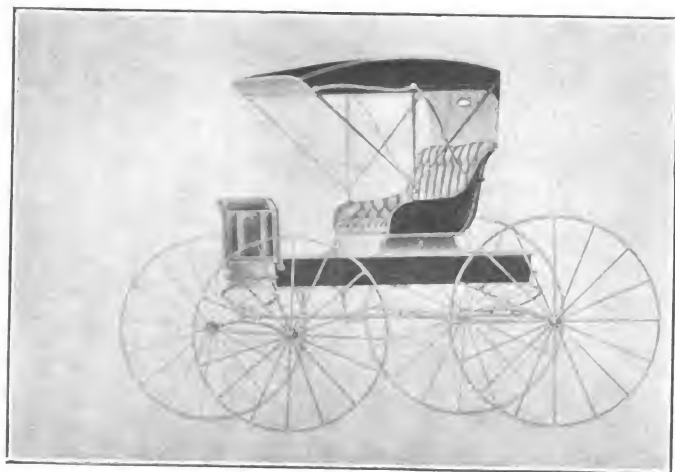
SAYERS & SCOVILLE
Cincinnati, Ohio



LION BUGGY CO.
Cincinnati, Ohio



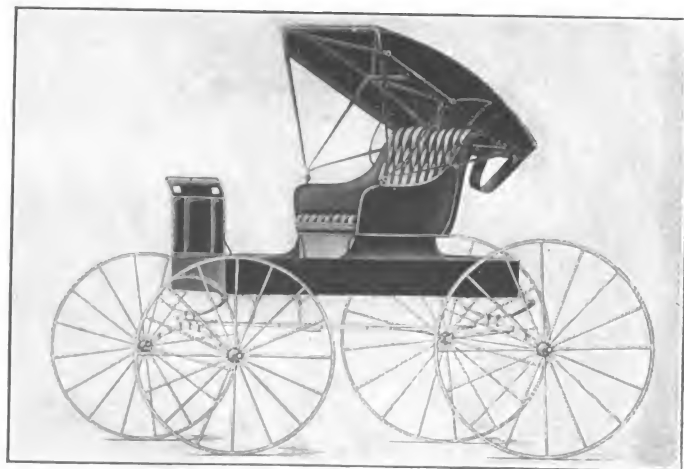
ZIMMERMAN MFG. CO
Auburn, Ind.



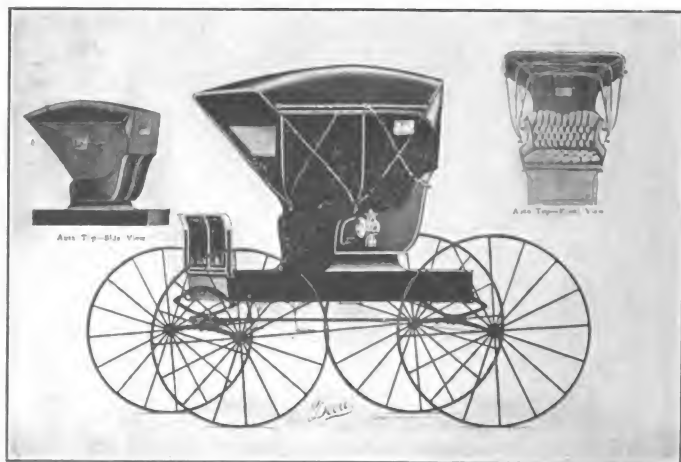
ANCHOR BUGGY CO.
Cincinnati, Ohio



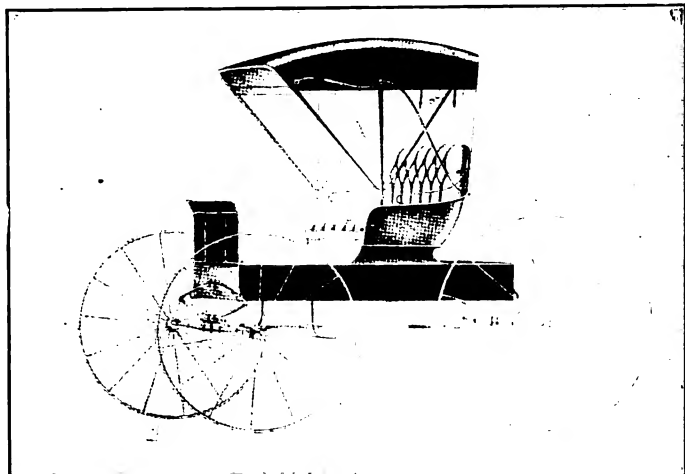
ZIMMERMAN MFG. CO
Auburn, Ind.



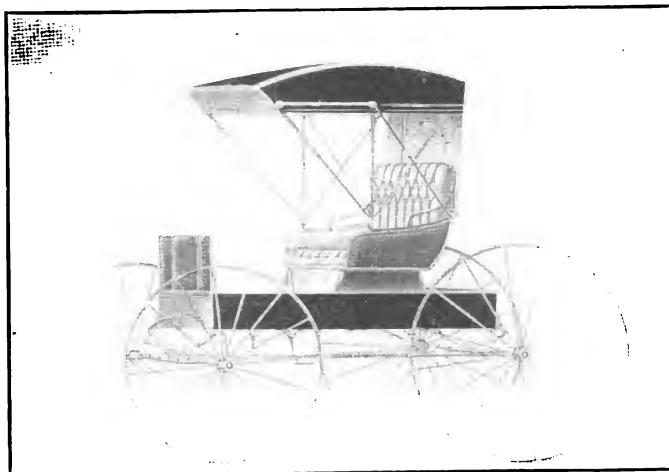
PARRY MANUFACTURING CO.
Indianapolis, Ind.



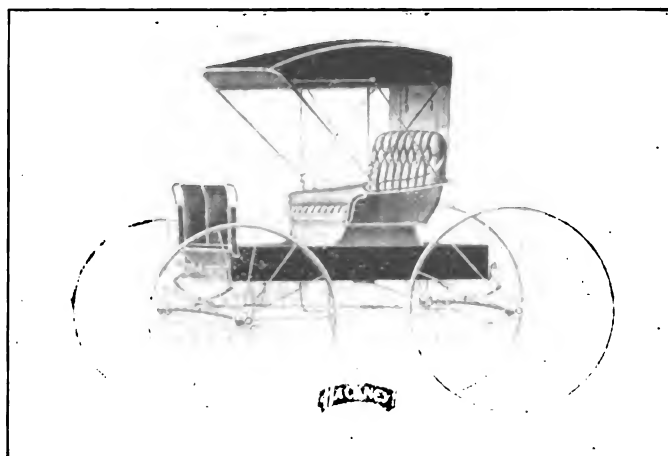
JOHN DEERE PLOW CO.
St. Louis, Mo.



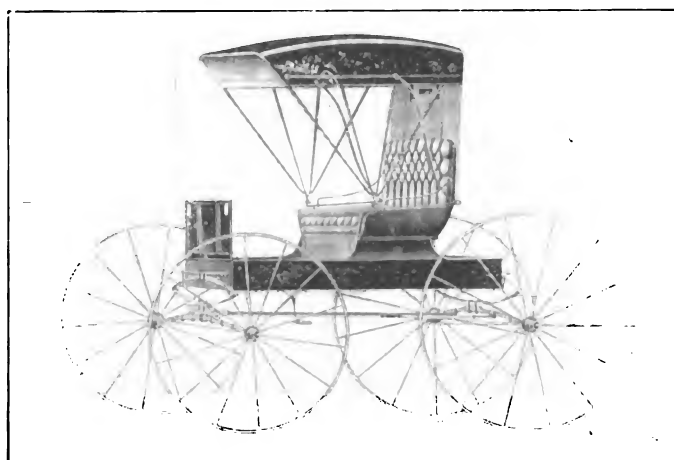
AMES-DEAN CARRIAGE CO.
Jackson, Mich.



RATTERMAN & LUTH
Cincinnati, Ohio



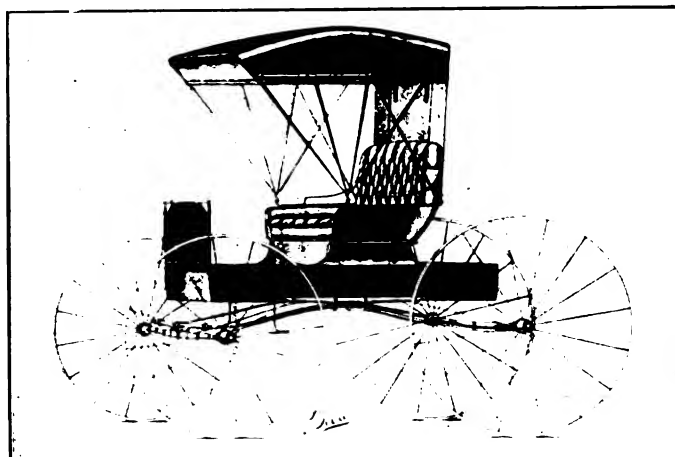
HACKNEY BROS.
Wilson, N. C.



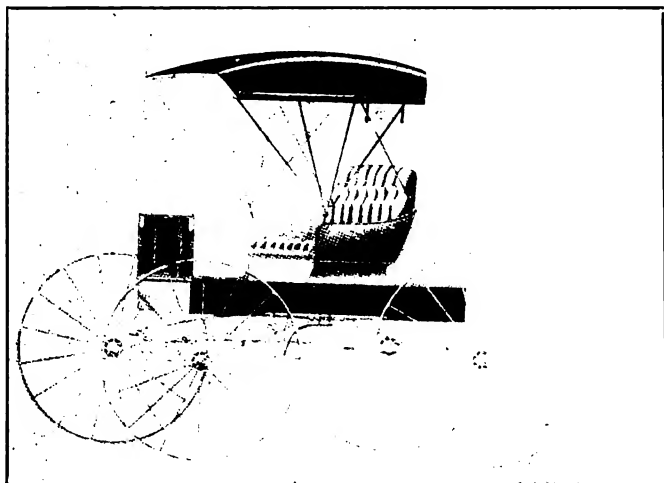
REGAL BUGGY CO.
St. Louis, Mo.



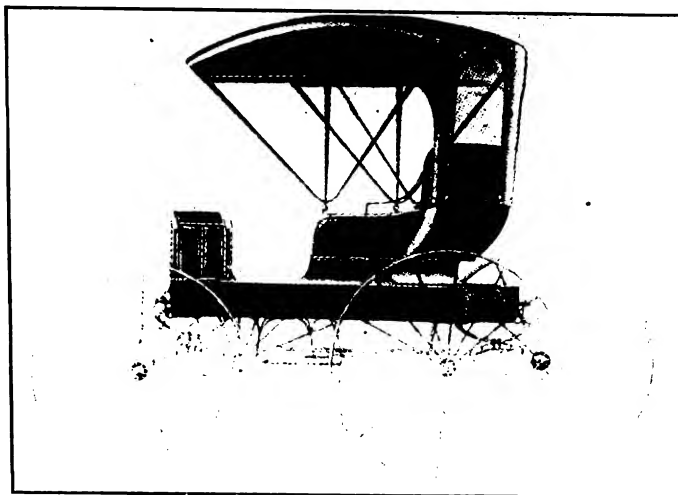
ANCHOR BUGGY CO.
Cincinnati, Ohio



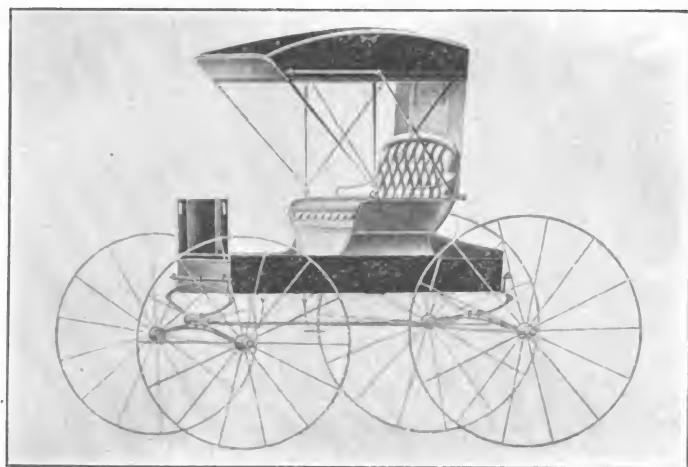
JOHN DEERE PLOW CO.
St. Louis, Mo.



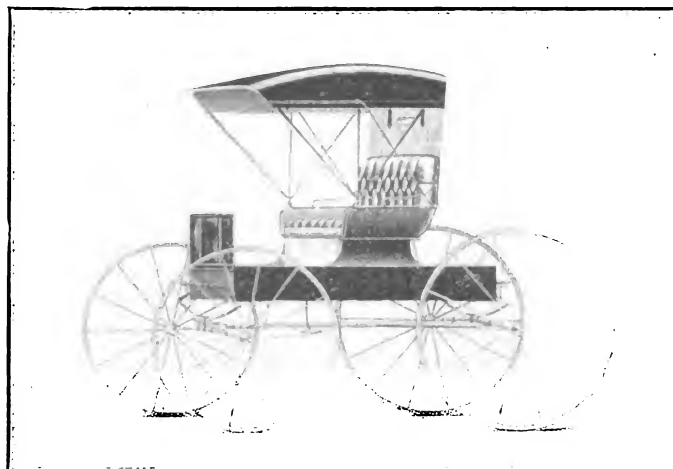
JOS. W. MOON BUGGY CO.
St. Louis, Mo.



JOS. W. MOON BUGGY CO.
St. Louis, Mo.



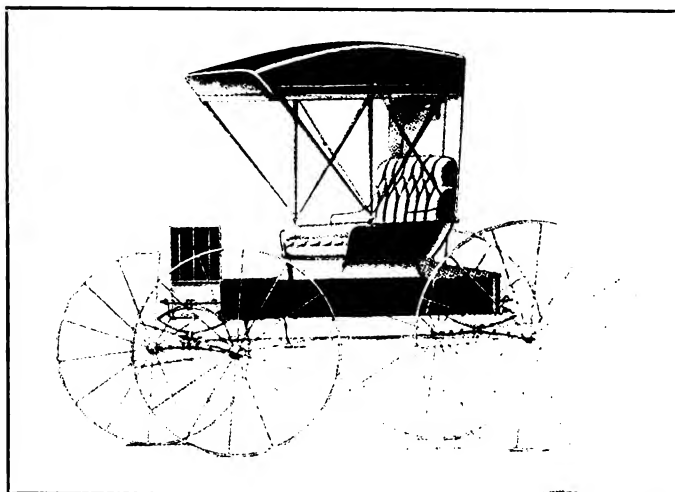
AHLBRAND CARRIAGE CO.
Seymour, Ind.



PETERS BUGGY CO.
Columbus, Ohio



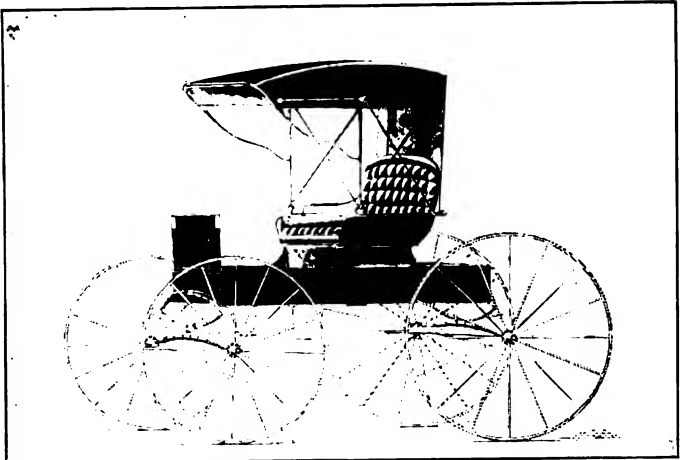
COLONIAL CARRIAGE CO.
Circleville, Ohio



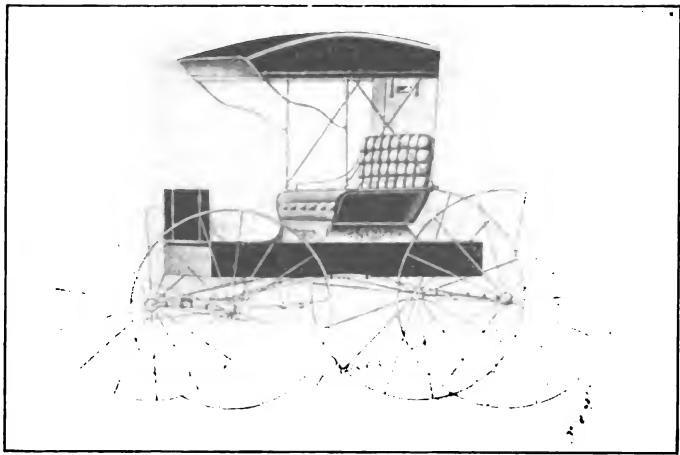
COLONIAL CARRIAGE CO.
Circleville, Ohio



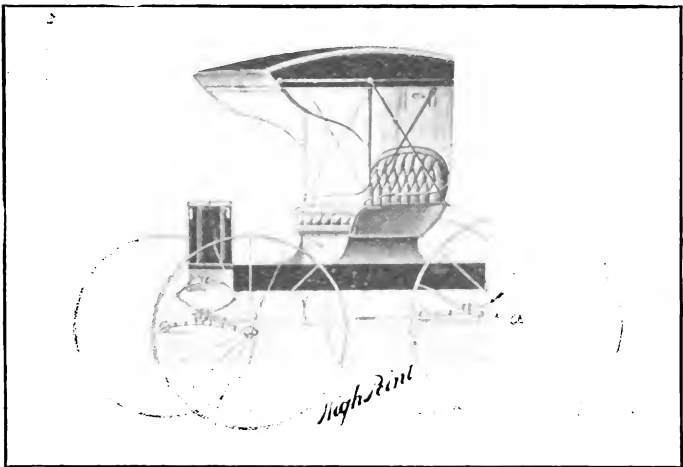
OXFORD BUGGY CO.
Oxford, N. C.



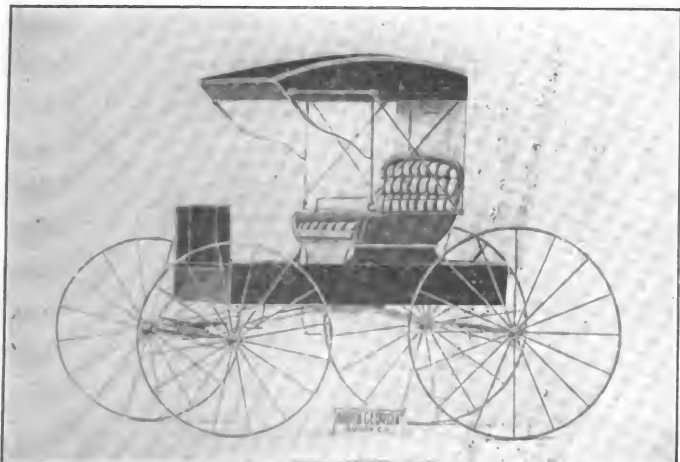
PARRY MANUFACTURING CO.
Indianapolis, Ind.



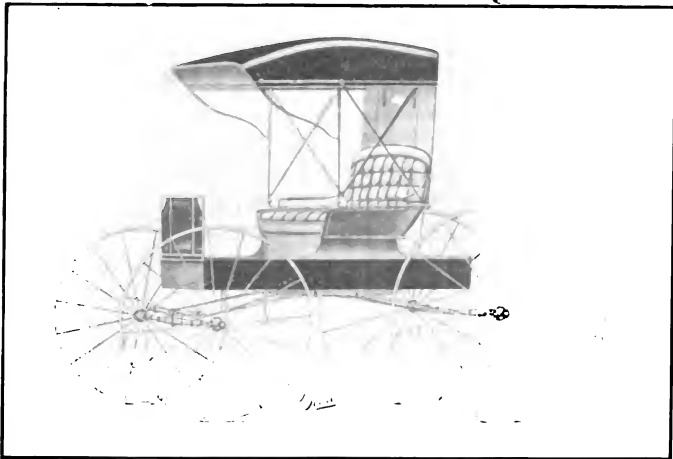
EUFULA BUGGY CO.
Eufaula, Ala.



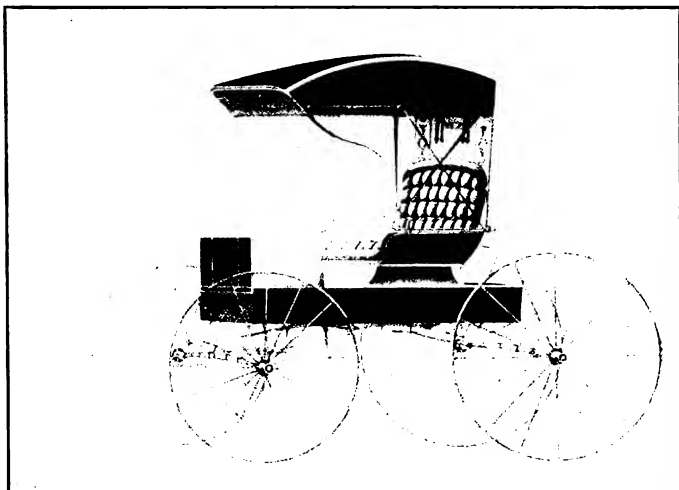
HIGH POINT BUGGY CO.
High Point, N. C.



SOUTH GEORGIA BUGGY CO.
Valdosta, Ga.



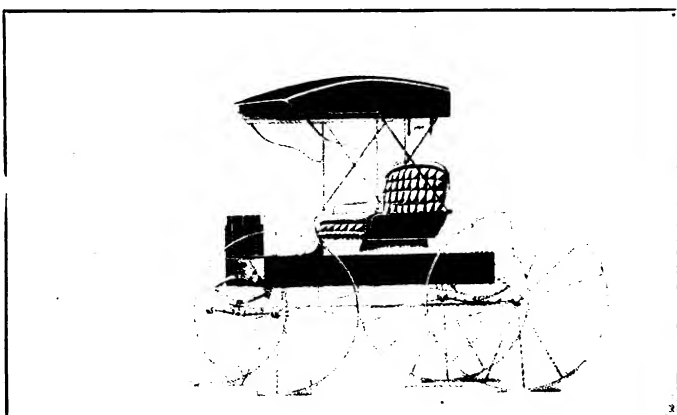
JOHN DEERE PLOW CO.
St. Louis, Mo.



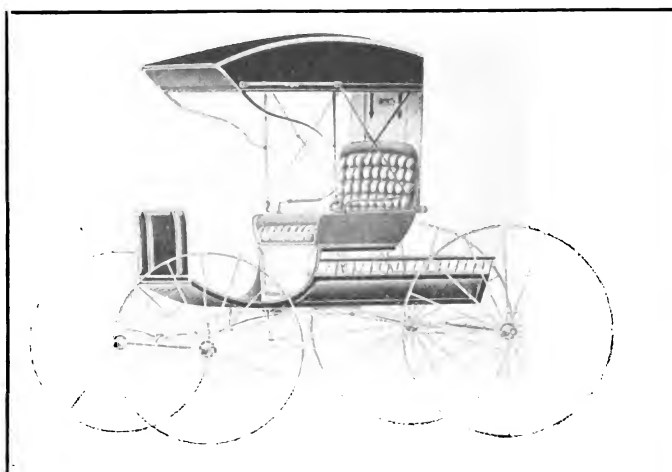
HULL VEHICLE MFG. CO.
Savannah, Ga.



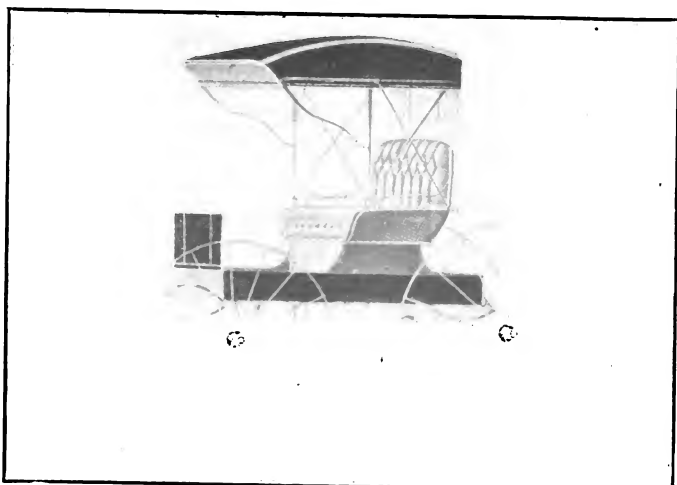
RATTERMAN & LUTH
Cincinnati, Ohio



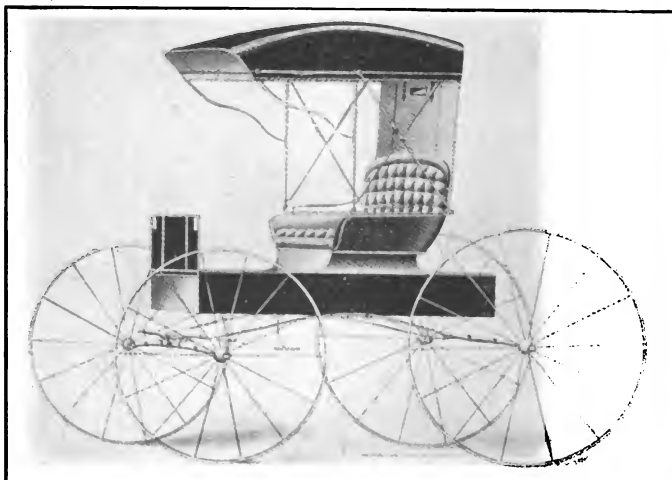
HUGHES BUGGY CO.
Lynchburg, Va.



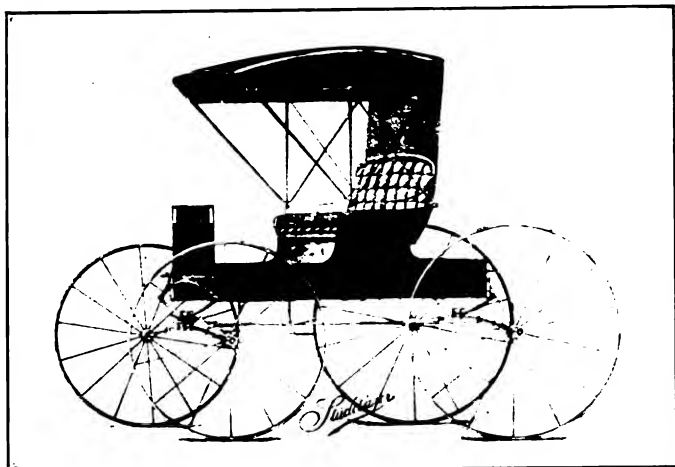
HUGHES BUGGY CO.
Lynchburg, Va.



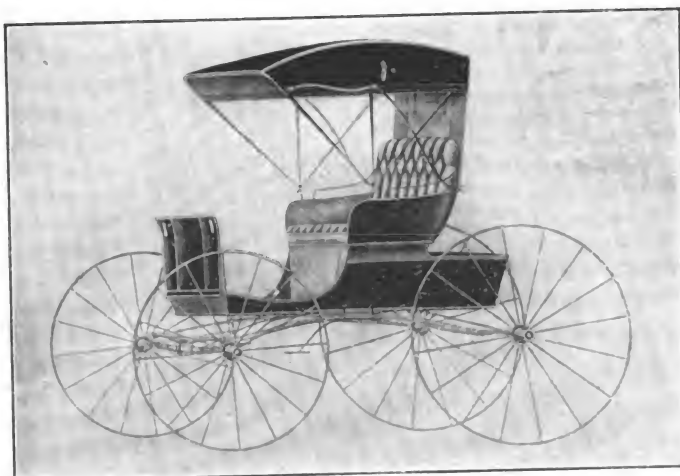
HUGHES BUGGY CO.
Lynchburg, Va.



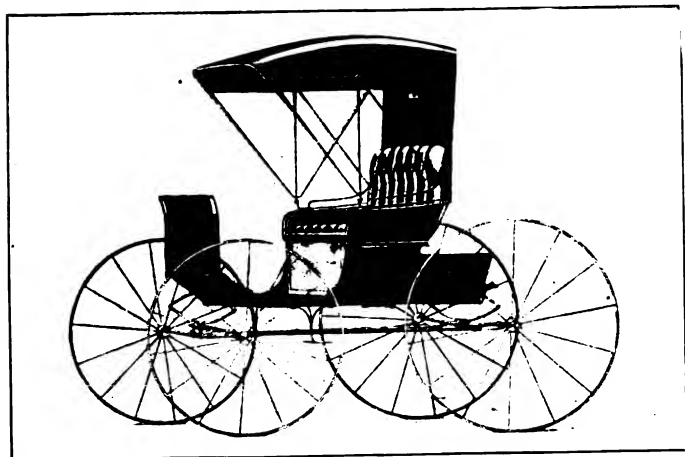
HULL VEHICLE MFG. CO.
Savannah, Ga.



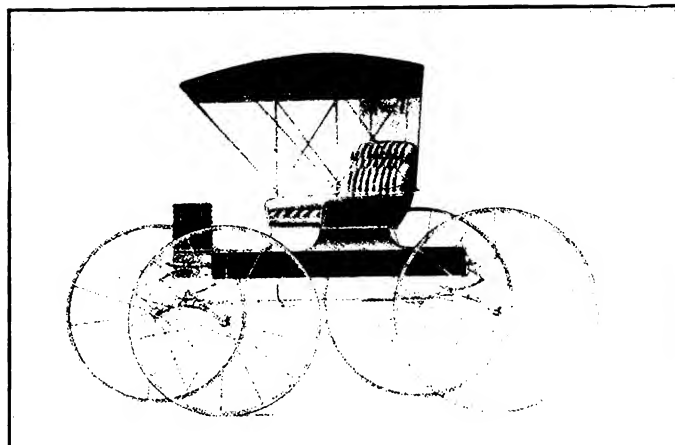
STUDEBAKER CORPORATION
South Bend, Ind.



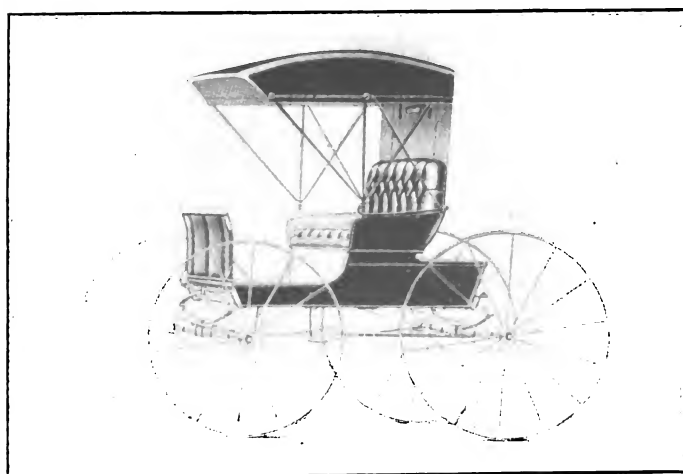
AHLBRAND CARRIAGE CO.
Seymour, Ind.



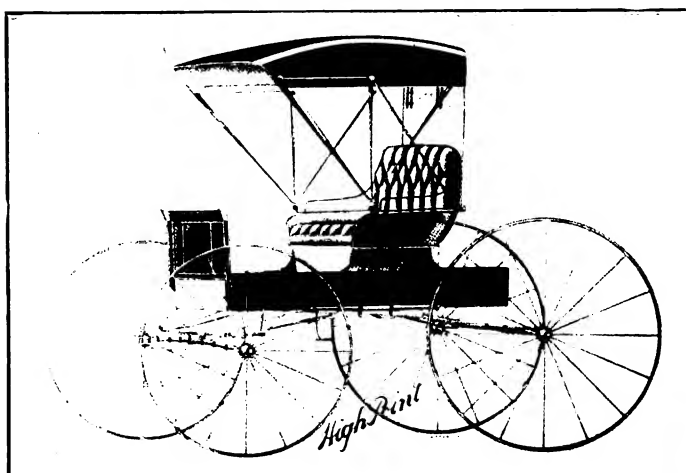
GERSTENSLAGER CO.
Wooster, Ohio



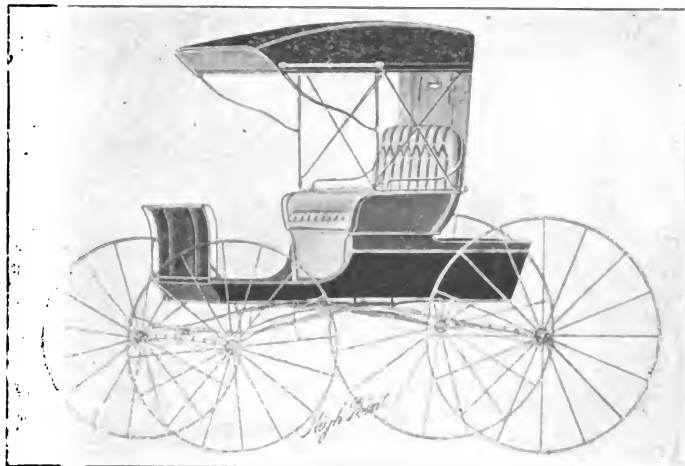
PETERS BUGGY CO.
Columbus, Ohio



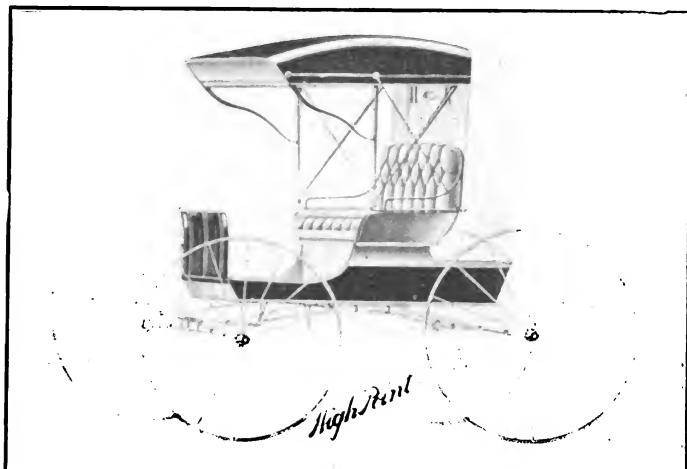
PETERS BUGGY CO.
Columbus, Ohio



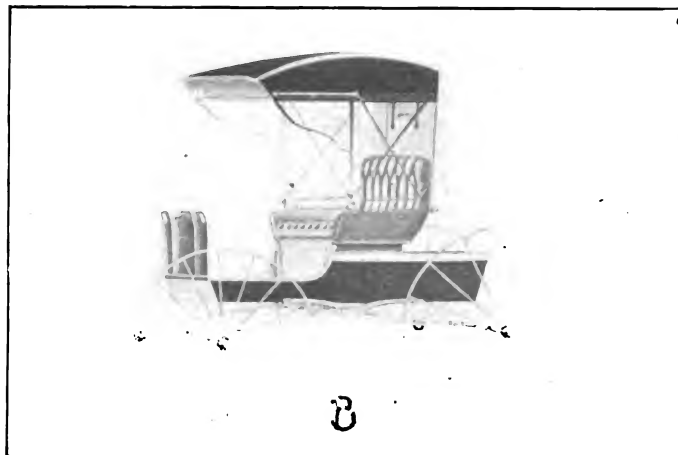
HIGH POINT BUGGY CO.
High Point, N. C.



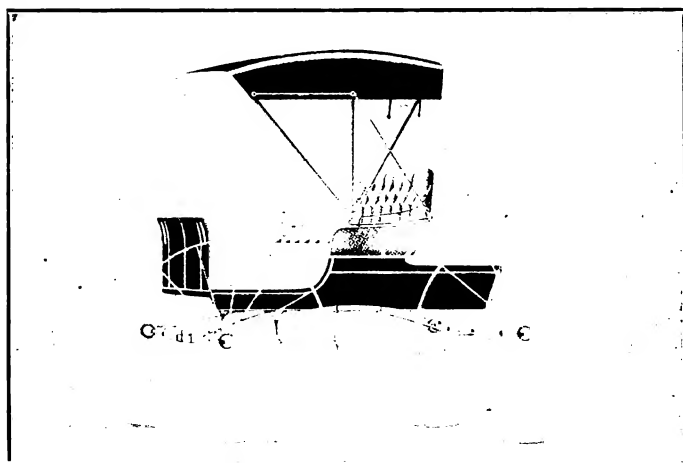
HIGH POINT BUGGY CO.
High Point, N. C.



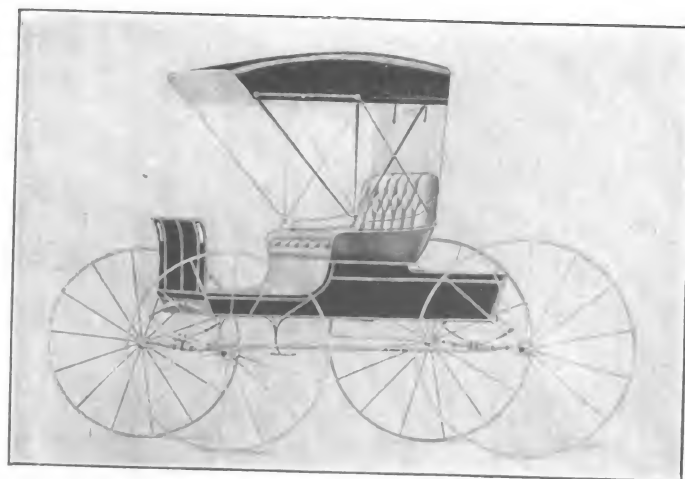
HIGH POINT BUGGY CO.
High Point, N. C.



OXFORD BUGGY CO.
Oxford, N. C.



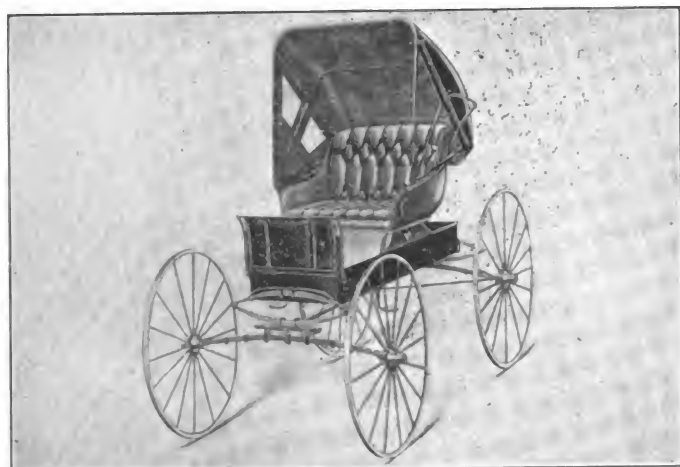
SULLIVAN BROS.
Rochester, N. Y.



SULLIVAN BROS.
Rochester, N. Y.



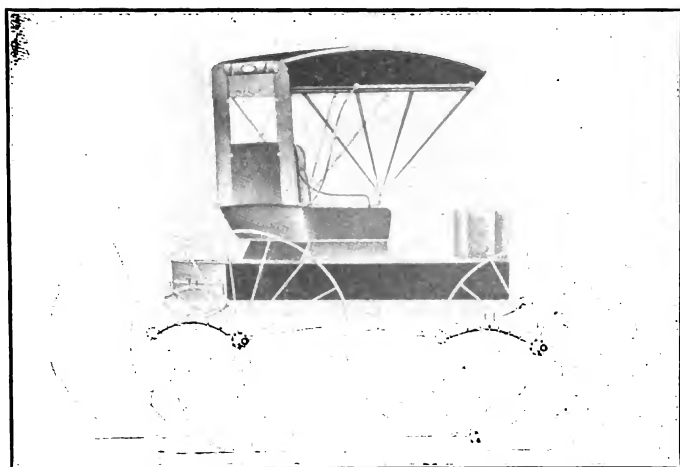
AMES-DEAN CARRIAGE CO.
Jackson, Mich.



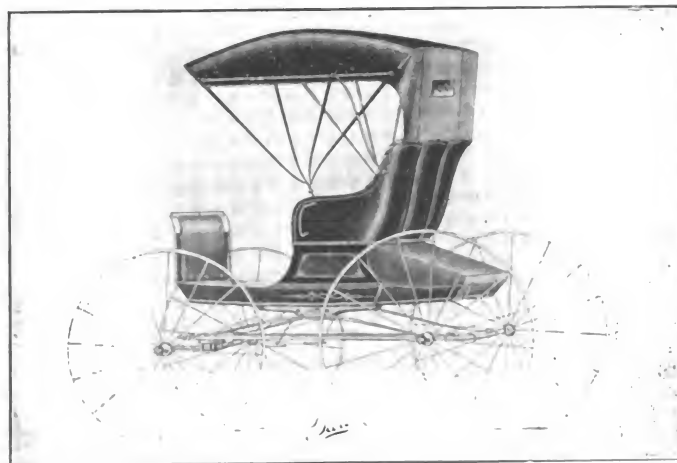
VELIE CARRIAGE CO.
Moline, Ill.



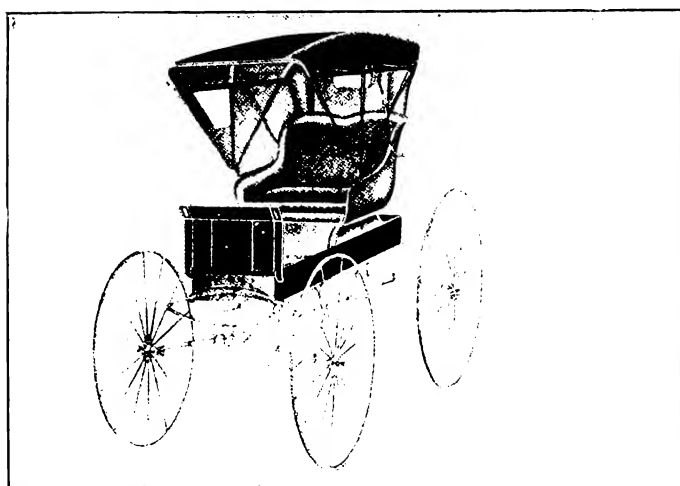
JOHN DEERE PLOW CO.
St. Louis, Mo.



OHIO VALLEY BUGGY CO.
Aurora, Ind.



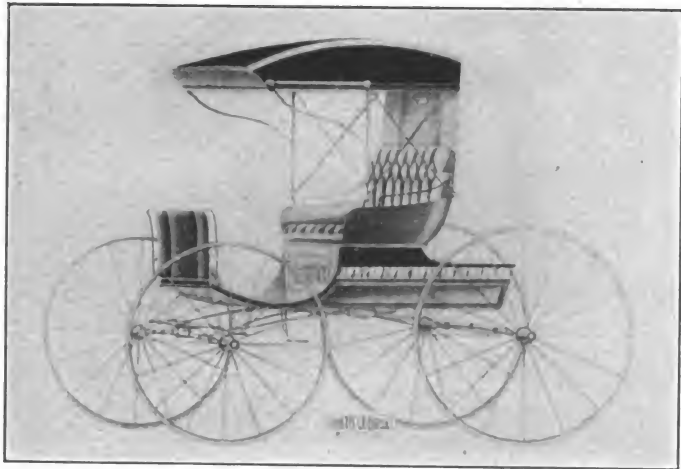
JOHN DEERE PLOW CO.
St. Louis, Mo.



ANCHOR BUGGY CO.
Cincinnati, Ohio



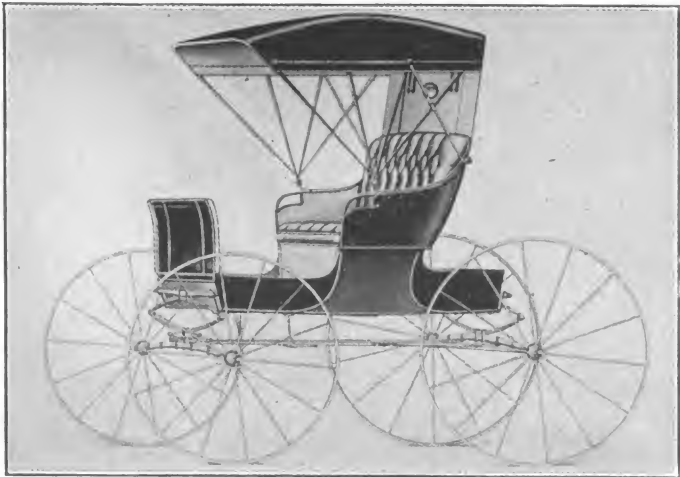
RATTERMAN & LUTH
Cincinnati, Ohio



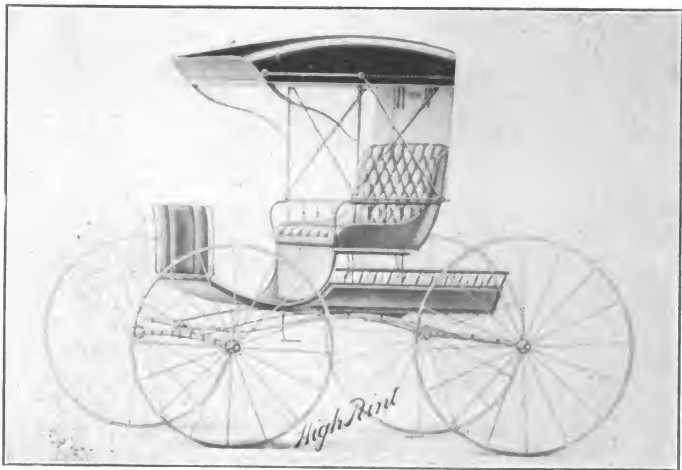
SOUTH GEORGIA BUGGY CO.
Valdosta, Ga.



OXFORD BUGGY CO.
Oxford, N. C.



STAVER CARRIAGE CO.
Chicago, Ill.



HIGH POINT BUGGY CO.
High Point, N. C.

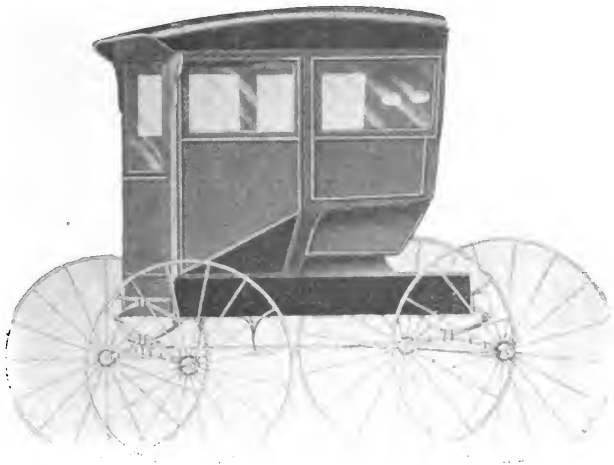


PARRY MANUFACTURING CO.
Indianapolis, Ind.

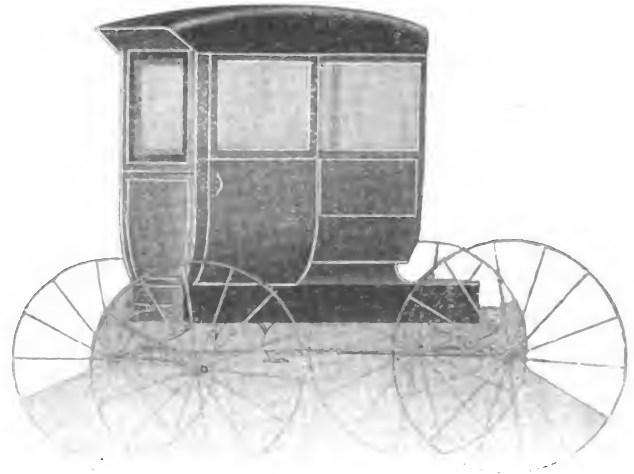


DURANT-DORT CARRIAGE CO.
Flint, Mich.

Storm Top Buggies



STUDEBAKER CORPORATION
South Bend, Ind.



PEABODY BUGGY CO.
Fosterla, Ohio.



BROWN CARRIAGE CO.
Cincinnati, Ohio



AHLBRAND CARRIAGE CO.
Seymour, Ind.



PETERS BUGGY CO.
Columbus, Ohio



AHLBRAND CARRIAGE CO.
Seymour, Ind.



STORM QUEEN BUGGY CO.
Wabash, Ind.



COLONIAL CARRIAGE CO.
Circleville, Ohio



REX BUGGY CO.
Connersville, Ind.

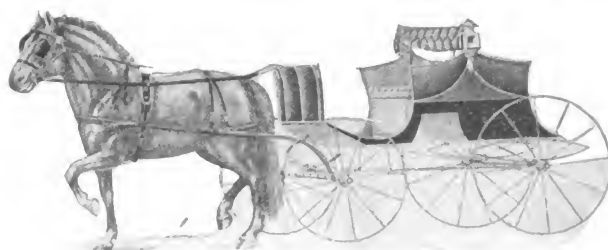
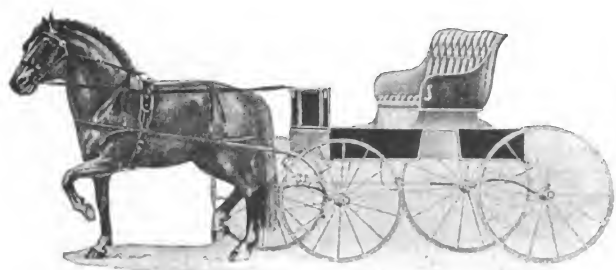


SEIDEL BUGGY CO.
Richmond, Ind.



C. R. PATTERSON & SONS,
Greenfield, Ohio.

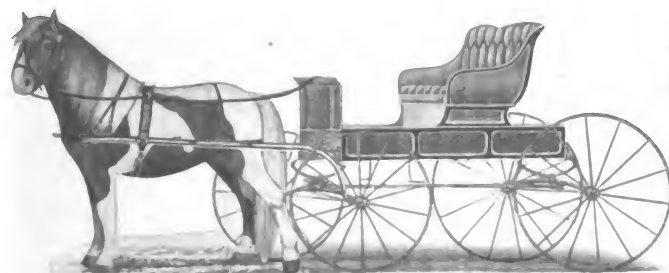
Pony Vehicles



QUEEN CITY CARRIAGE CO.
Cincinnati, Ohio.



BROOKSHIRE & ROBINSON
Saint Paris, Ohio



EAGLE CARRIAGE CO.
Cincinnati, Ohio

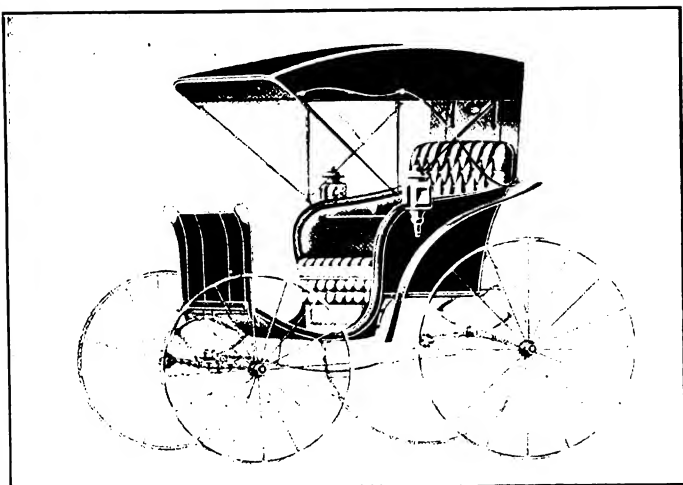
Phaetons



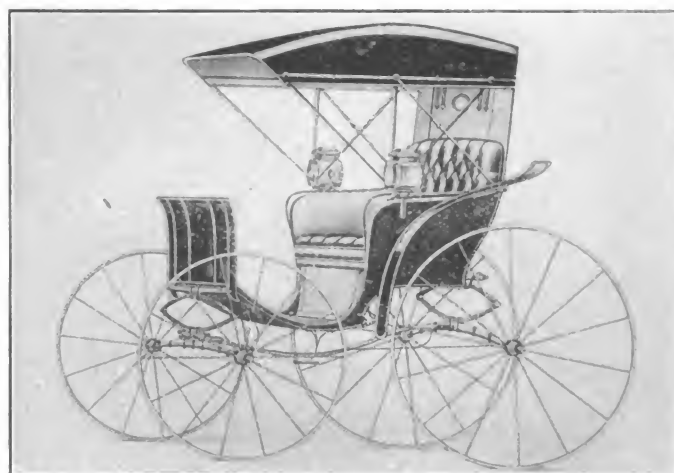
RATTERMAN & LUTH
Cincinnati, Ohio



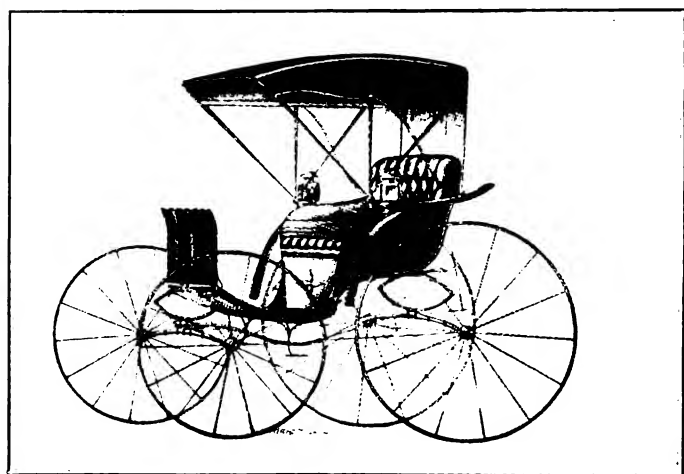
SAYERS & SCOVILL
Cincinnati, Ohio



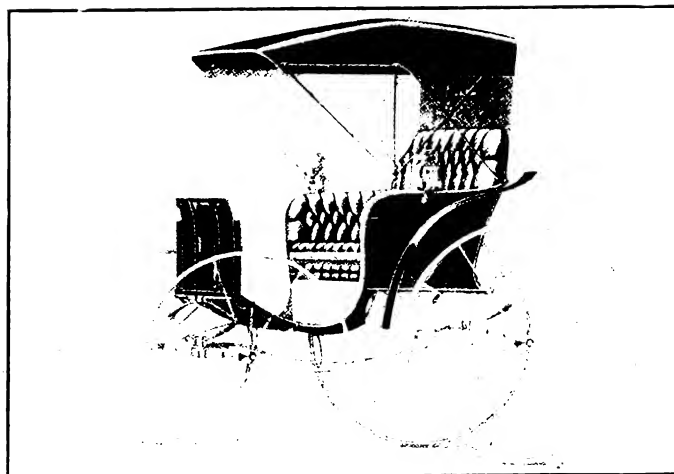
AHLBRAND CARRIAGE CO.
Seymour, Ind.



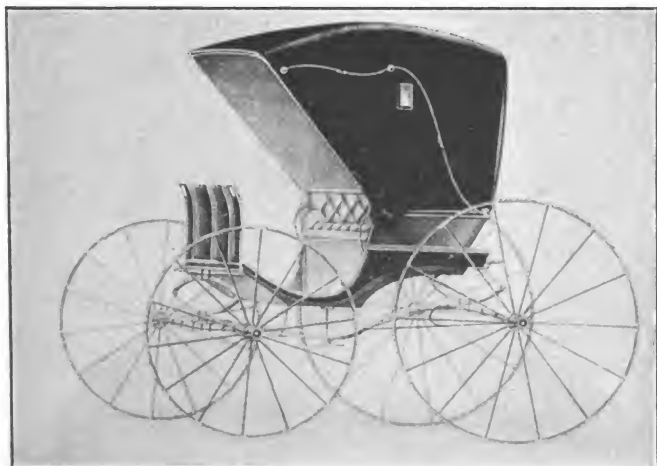
STAVEL CARRIAGE CO.
Chicago, Ill.



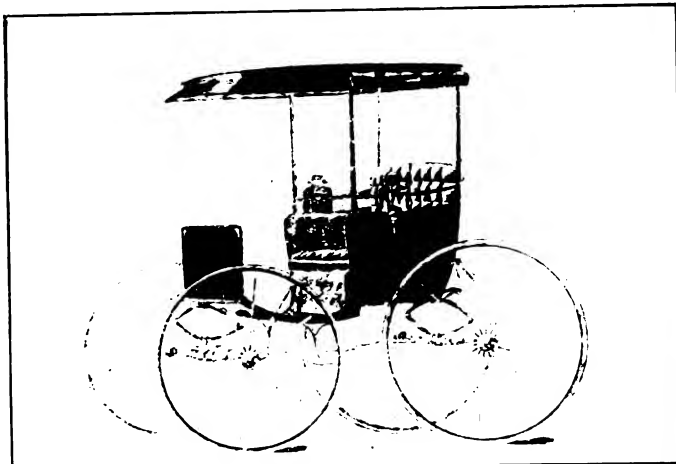
RATTERMAN & LUTH
Cincinnati, Ohio



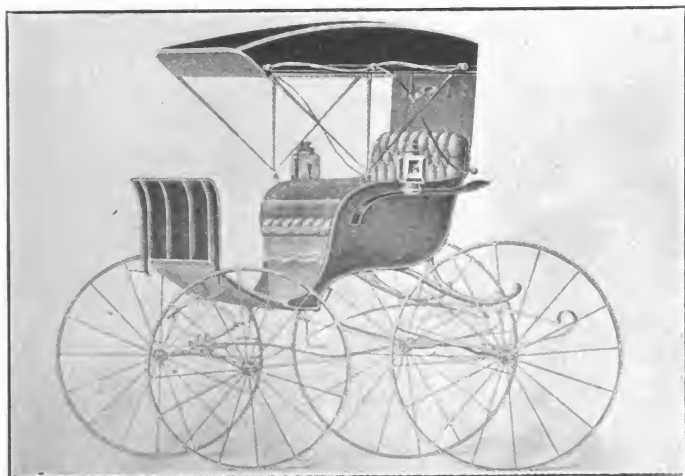
PETERS BUGGY CO.
Columbus, Ohio



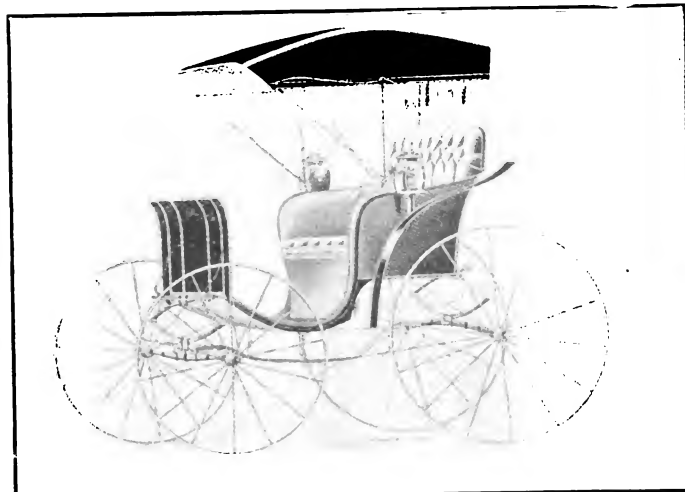
C. R. PATTERSON & SONS,
Greenfield, Ohio.



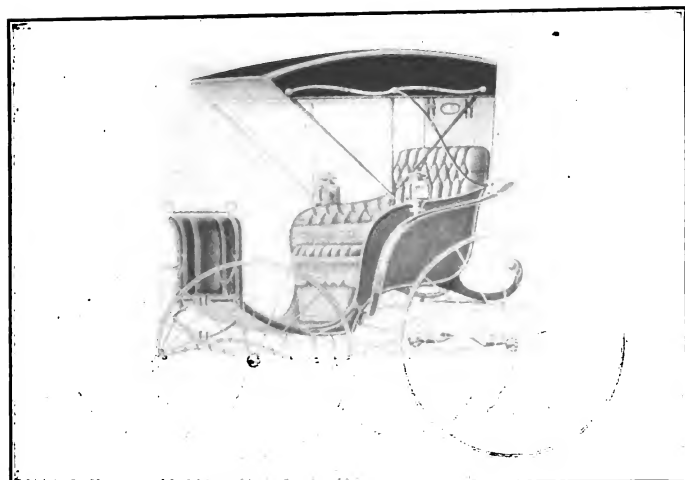
S. E. BAILY & Co.
Lancaster, Pa.



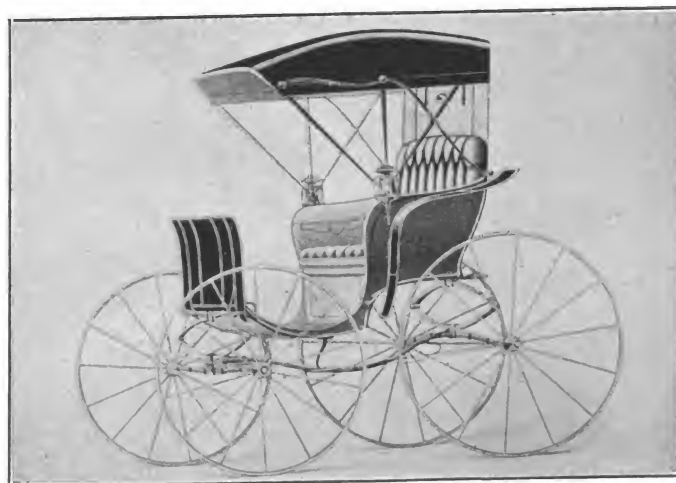
RATTERMAN & LUTH
Cincinnati, Ohio



COLONIAL CARRIAGE CO.
Circleville, Ohio



RATTERMAN & LUTH
Cincinnati, Ohio



CONNEVILLE BUGGY CO.
Connersville, Ind.

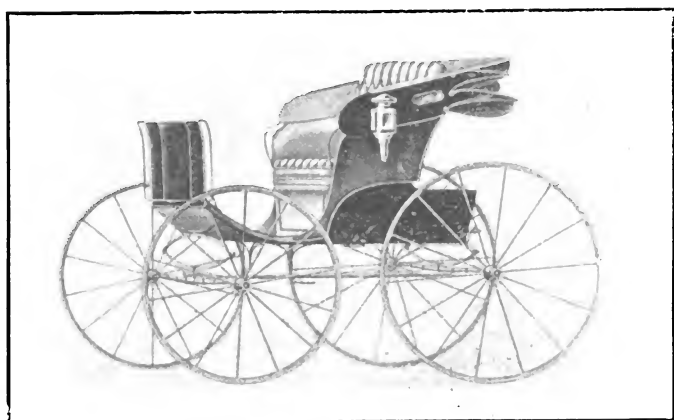
Stanhopes



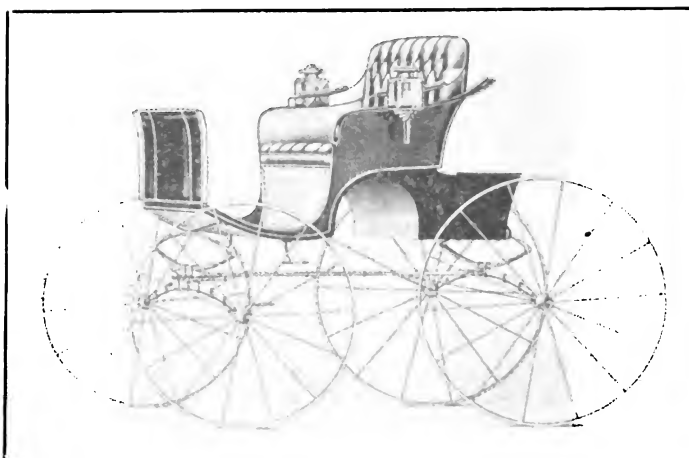
RATTERMAN & LUTH
Cincinnati, Ohio



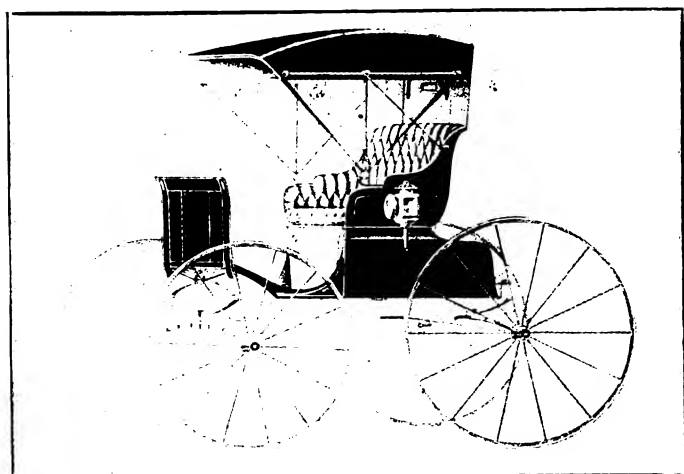
COLUMBUS BUGGY CO.
Columbus, Ohio



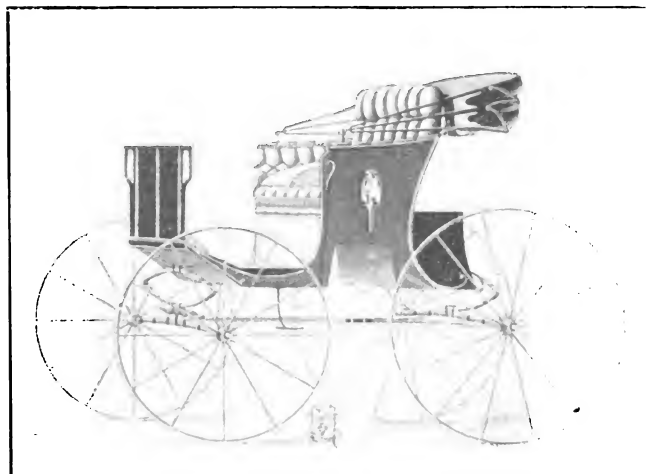
C. R. PATTERSON & SONS,
Greenfield, Ohio.



STAVES CARRIAGE CO.
Chicago, Ill.

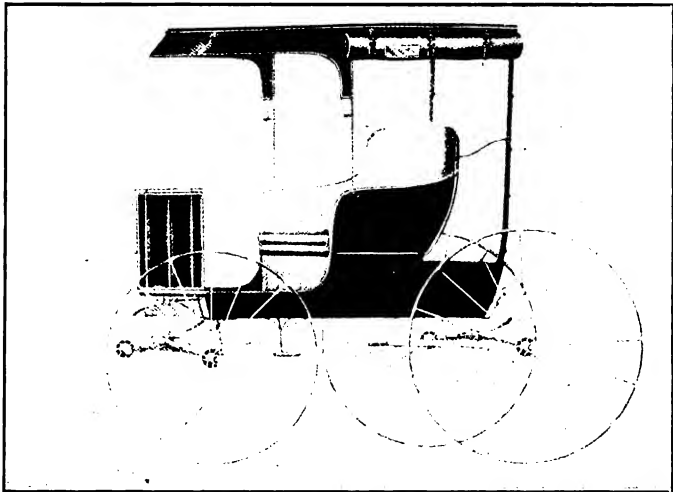


RATTERMAN & LUTH
Cincinnati, Ohio



ZIMMERMAN MFG. CO
Auburn, Ind.

STANHOPE



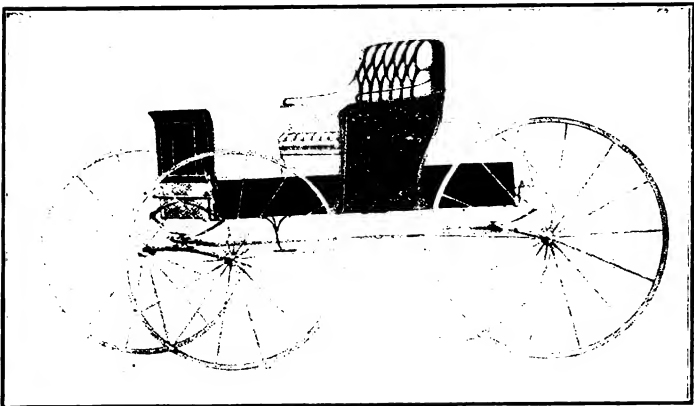
JOS. W. MOON BUGGY CO.
St. Louis, Mo.

OPEN STANHOPE

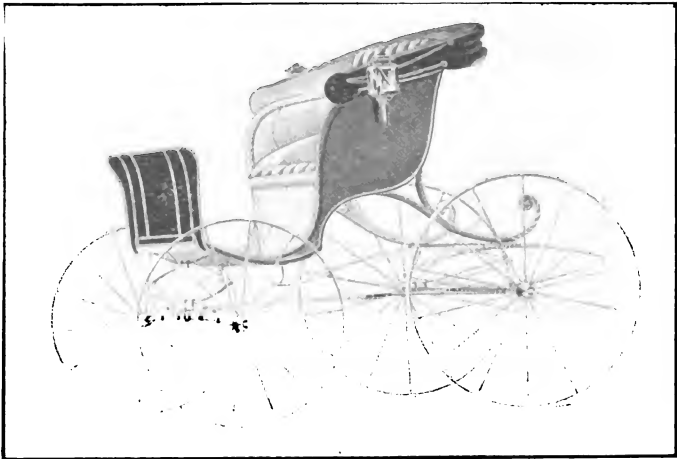


COLUMBUS BUGGY Co.
Columbus, Ohio

SPIDER PHAETON

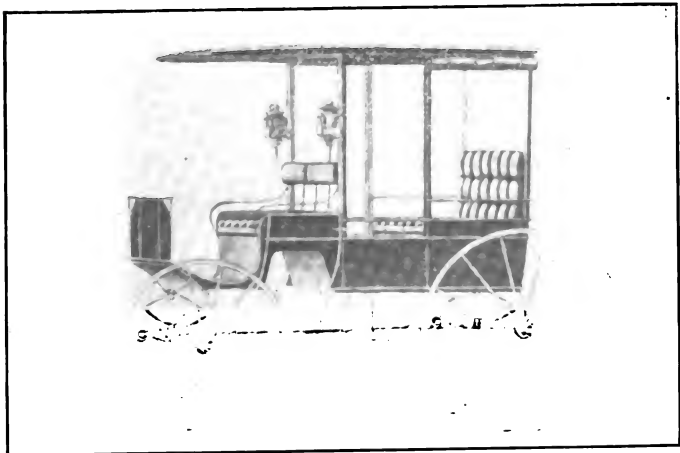


AMES-DEAN CARRIAGE CO.
Jackson, Mich.

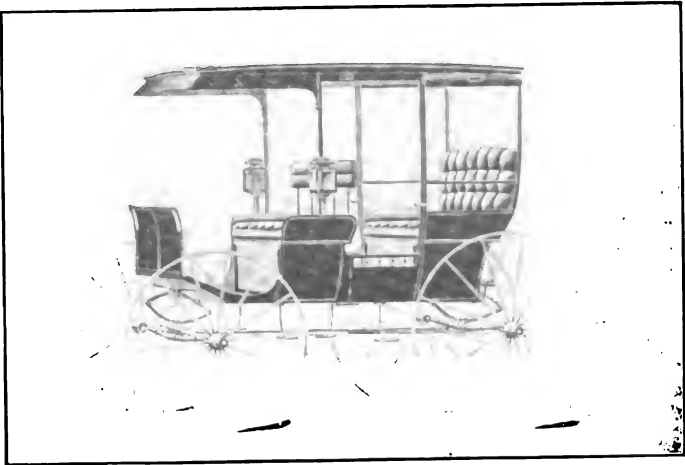


COLUMBUS BUGGY Co.
Columbus, Ohio

STATION WAGONS

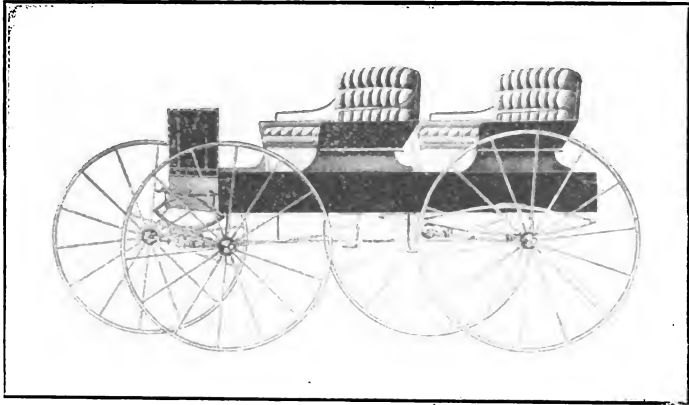


S. E. BAILY & Co.
Lancaster, Pa.

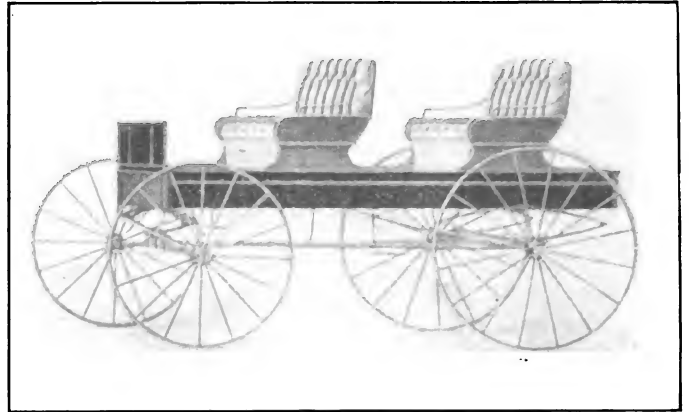


S. E. BAILY & Co.
Lancaster, Pa.

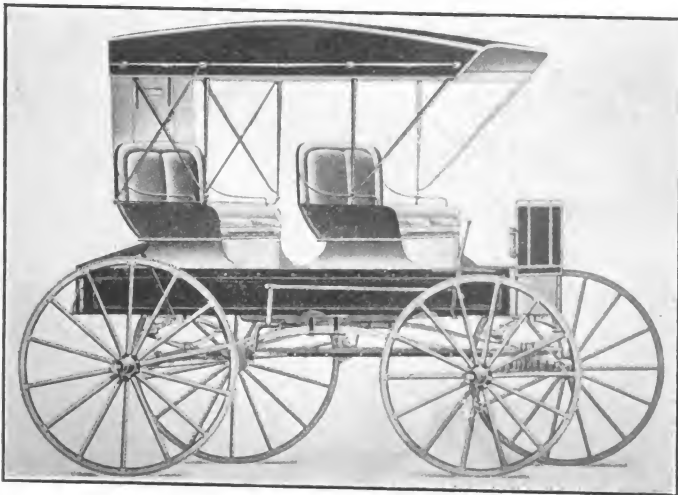
Spring Wagons



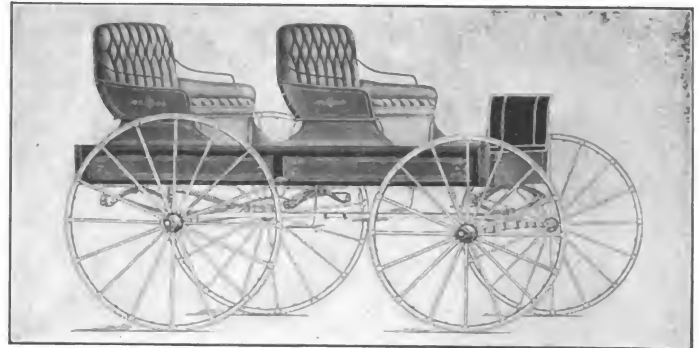
SULLIVAN BROS.
Rochester, N. Y.



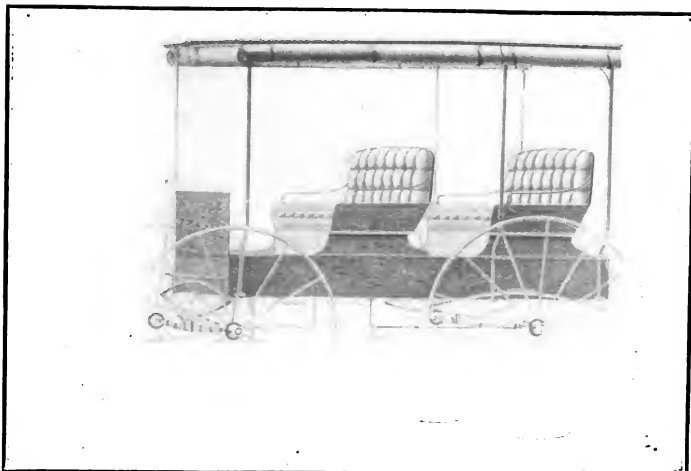
DURANT-DORT CARRIAGE CO.
Flint, Mich.



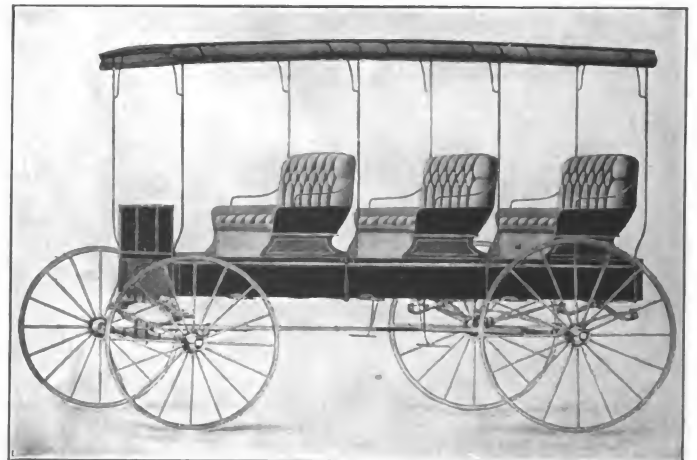
MARSHALLTOWN BUGGY CO.
Marshalltown, Iowa



PARRY MANUFACTURING CO.,
Indianapolis, Ind.

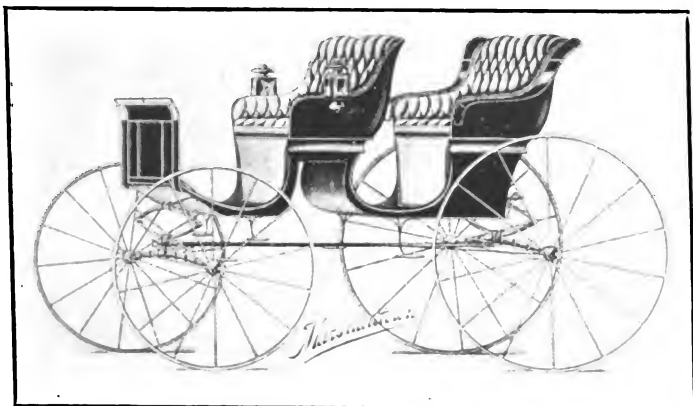


SULLIVAN BROS.
Rochester, N. Y.



AMES-DEAN CARRIAGE CO.
Jackson, Mich.

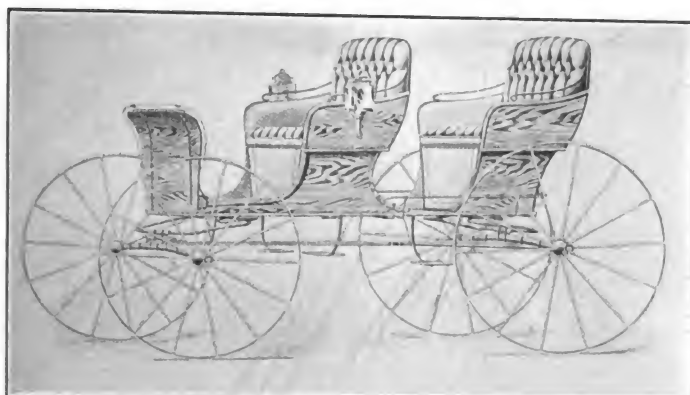
Open Surreys



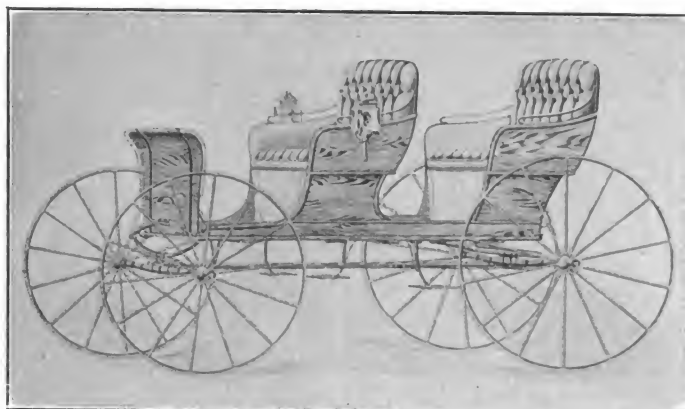
MARSHALLTOWN BUGGY CO.
Marshalltown, Iowa



HIGH POINT BUGGY CO.
High Point, N. C.



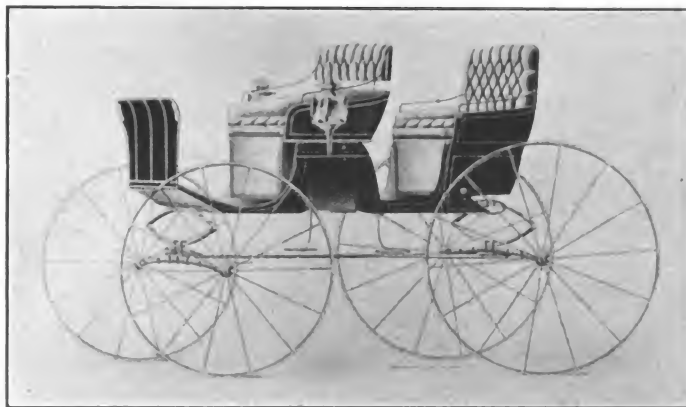
AMES-DEAN CARRIAGE CO.
Jackson, Mich.



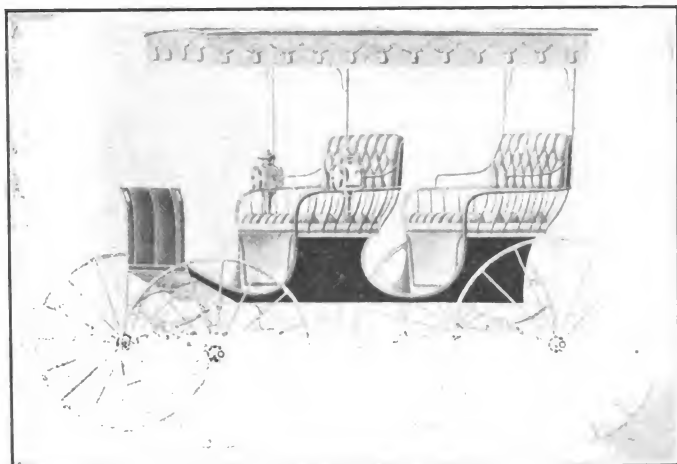
AMES-DEAN CARRIAGE CO.
Jackson, Mich.



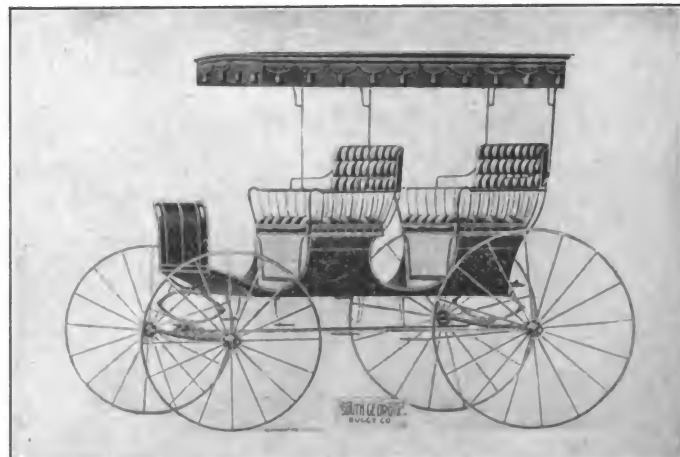
STAVAR CARRIAGE CO.
Chicago, Ill.



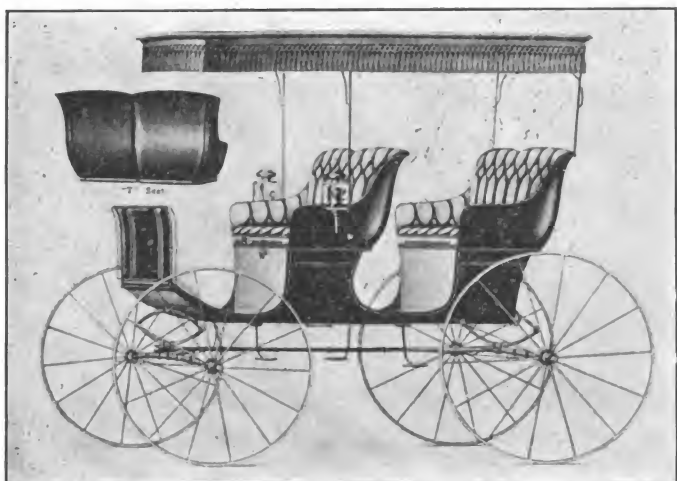
STAVAR CARRIAGE CO.
Chicago, Ill.



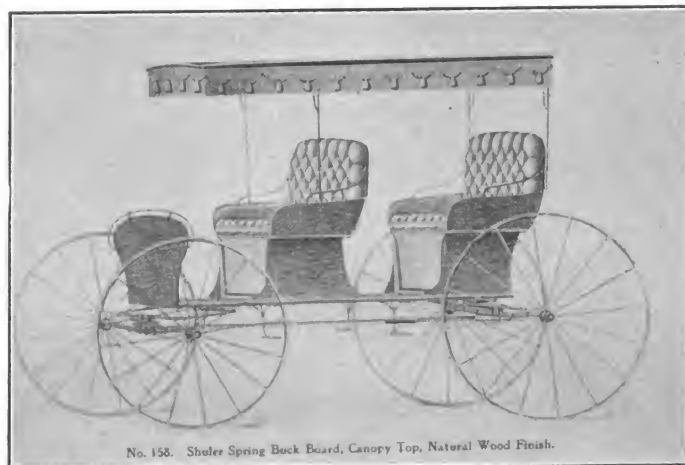
HUGHES BUGGY CO.
Lynchburg, Va.



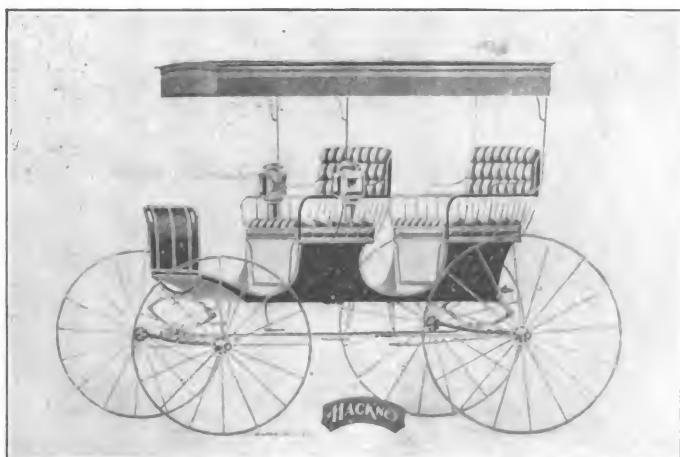
SOUTH GEORGIA BUGGY CO.
Valdosta, Ga.



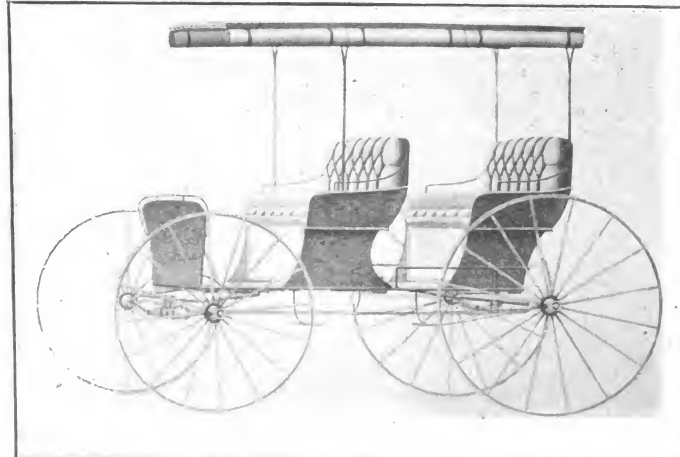
STAVEL CARRIAGE CO.
Chicago, Ill.



RATTERMAN & LUTH
Cincinnati, Ohio



HACKNEY BROS.
Wilson, N. C.



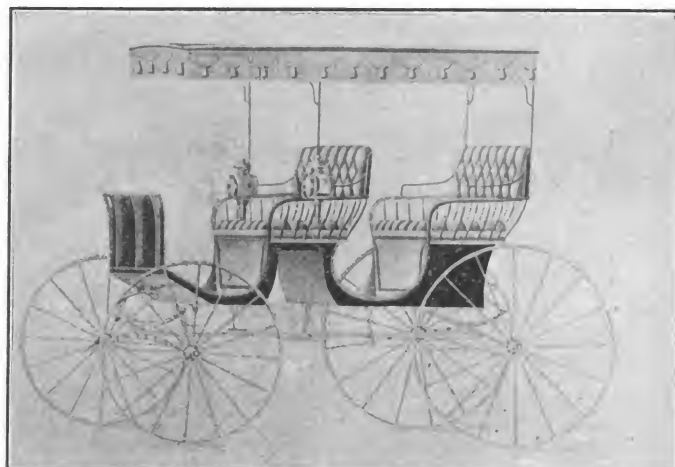
SULLIVAN BROS.
Rochester, N. Y.

Surreys

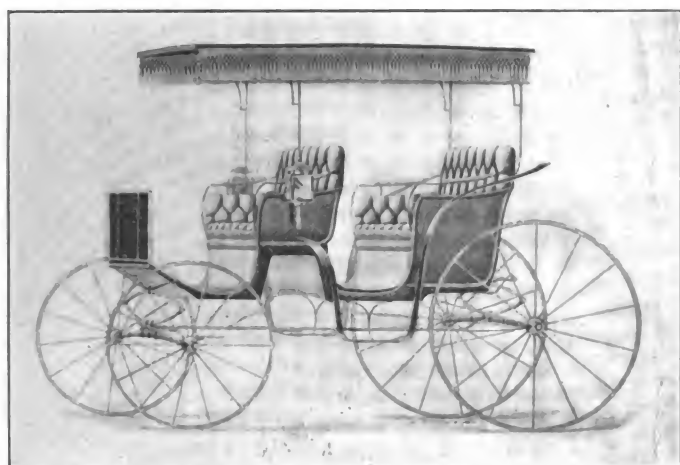
CANOPY TOPS



STUDEBAKER CORPORATION
South Bend, Ind.



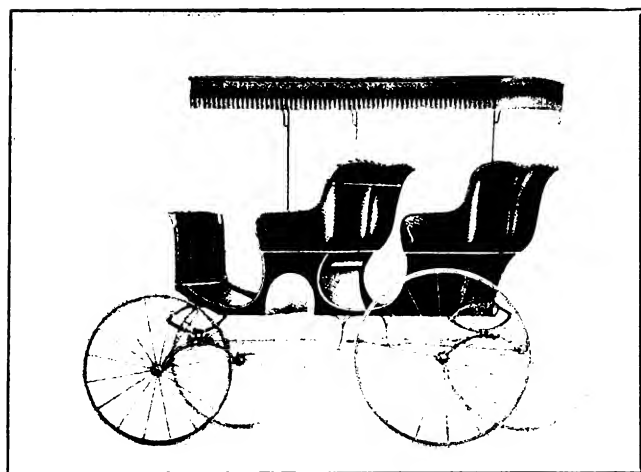
HUGHES BUGGY CO.
Lynchburg, Va.



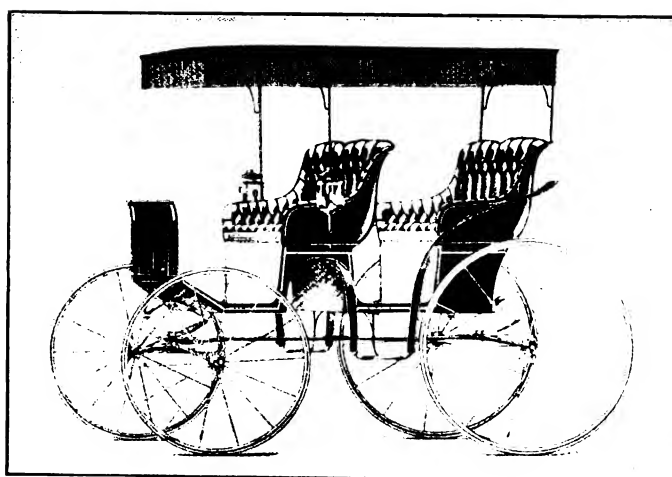
W. N. BROCKWAY,
Homer, N. Y.



AHLBRAND CARRIAGE CO.
Seymour, Ind.



REGAL BUGGY CO.
St. Louis, Mo.

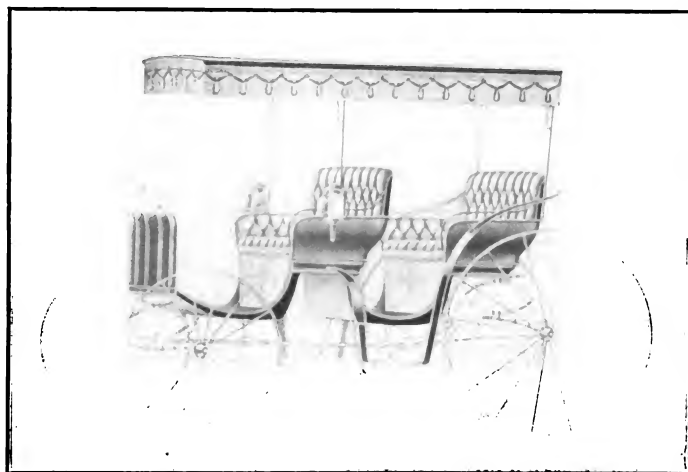


PETERS BUGGY CO.
Columbus, Ohio

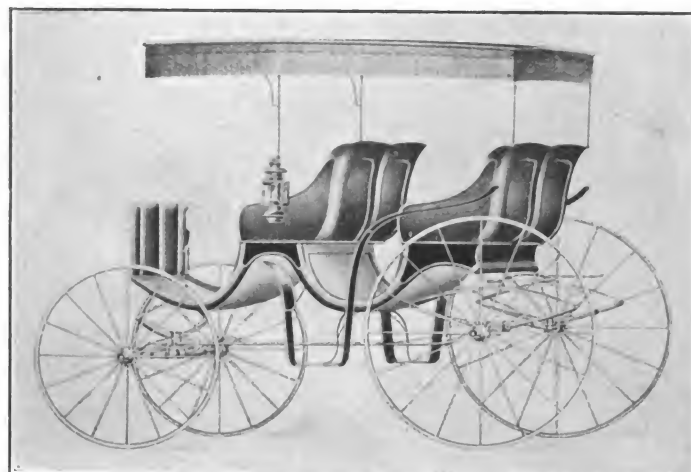
Surreys

CANOPY TOPS

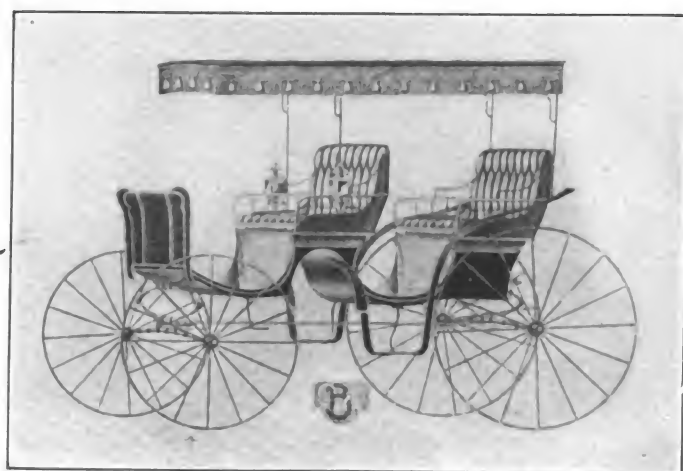
Cabriolets



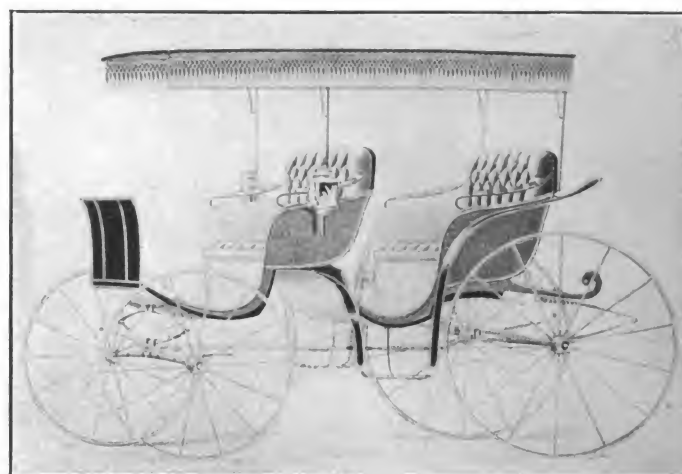
RATTERMAN & LUTH
Cincinnati, Ohio



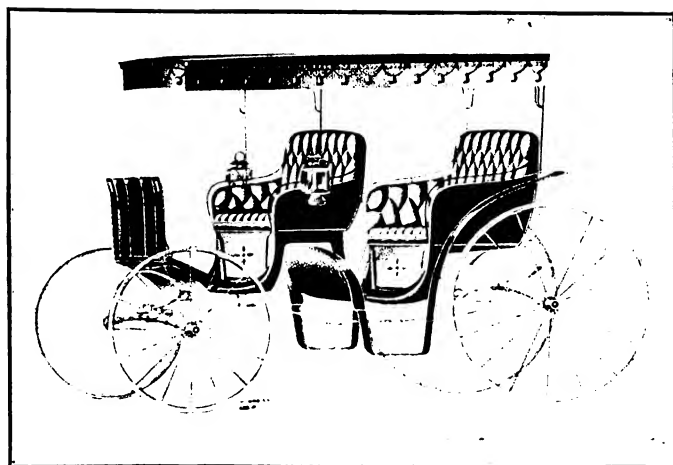
SECHLER & CO.
Cincinnati, Ohio



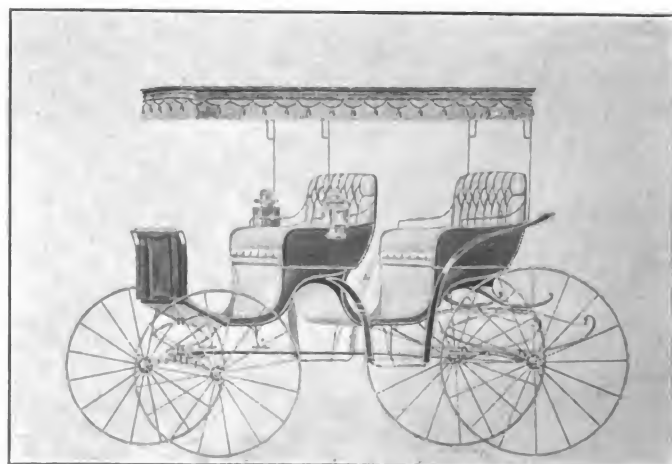
OXFORD BUGGY CO.
Oxford, N. C.



COLUMBUS BUGGY CO.
Columbus, Ohio

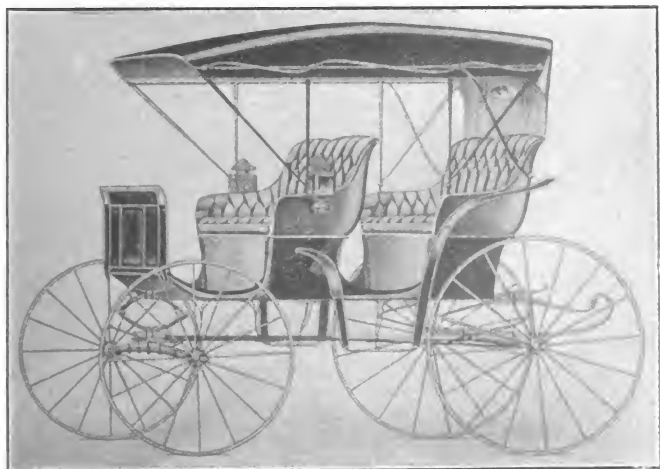


RATTERMAN & LUTH
Cincinnati, Ohio

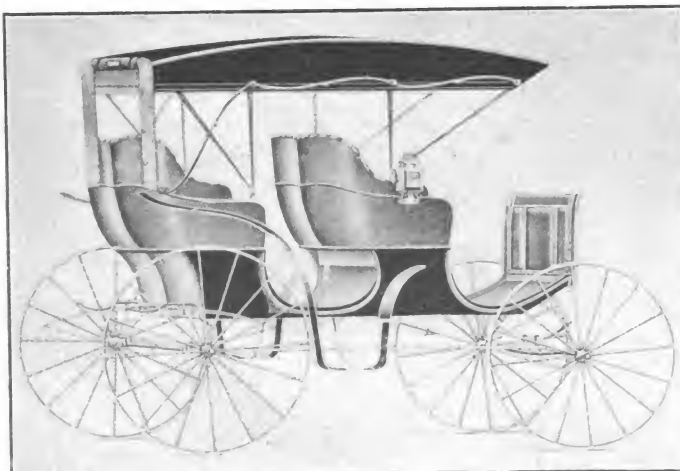


JOS. W. MOON BUGGY CO.
St. Louis, Mo.

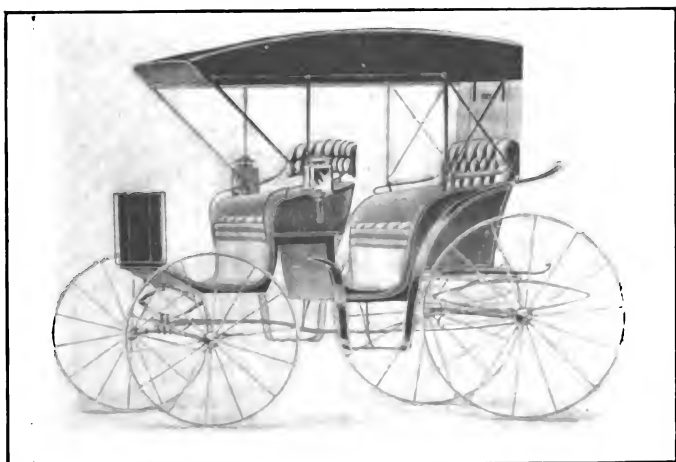
**CABRIOLETS
EXTENSION TOP**



MARSHALLTOWN BUGGY CO.
Marshalltown, Iowa



OHIO VALLEY BUGGY CO.
Aurora, Ind.

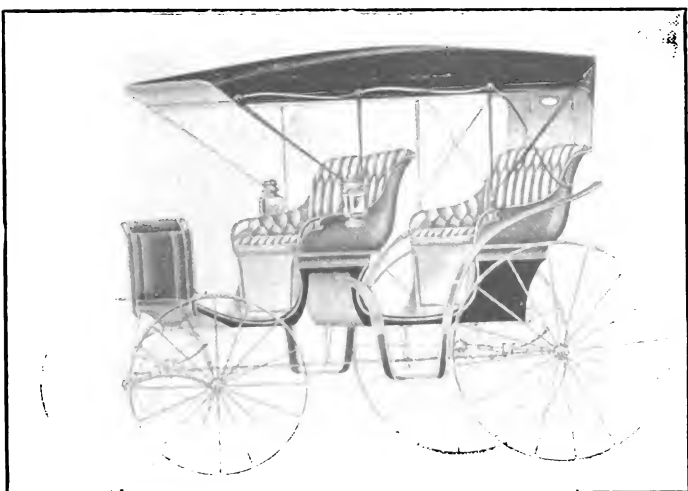


W. N. BROCKWAY,
Homer, N. Y.

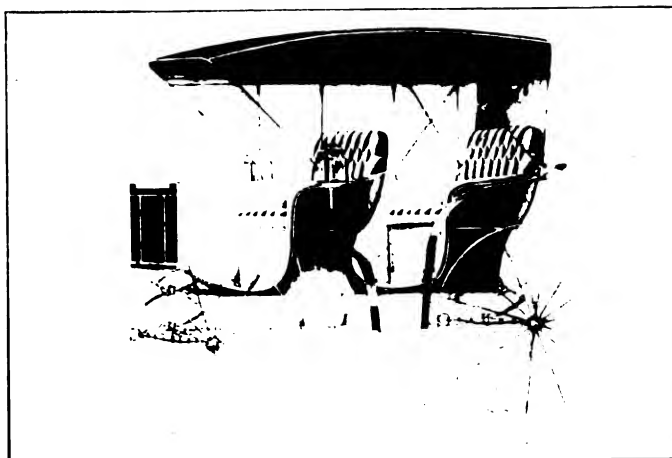


JOS. W. MOON BUGGY CO.
St. Louis, Mo.

**SURREYS
EXTENSION TOP**



ANCHOR BUGGY CO.
Cincinnati, Ohio



HULL VEHICLE MFG. CO.
Savannah, Ga.

Surreys

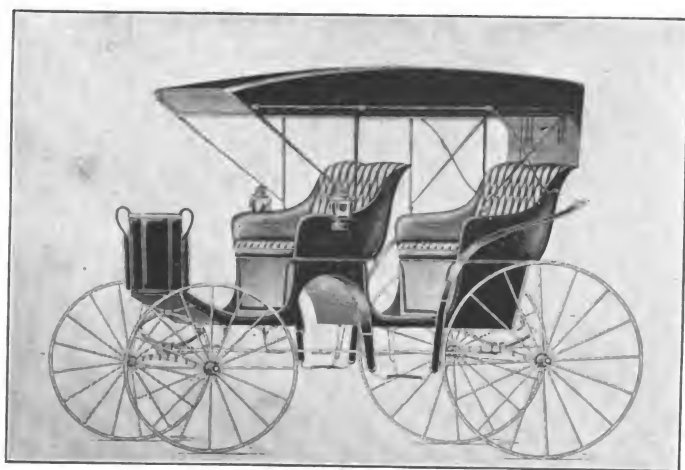
EXTENSION TOP



HIGH POINT BUGGY CO.
High Point, N. C.



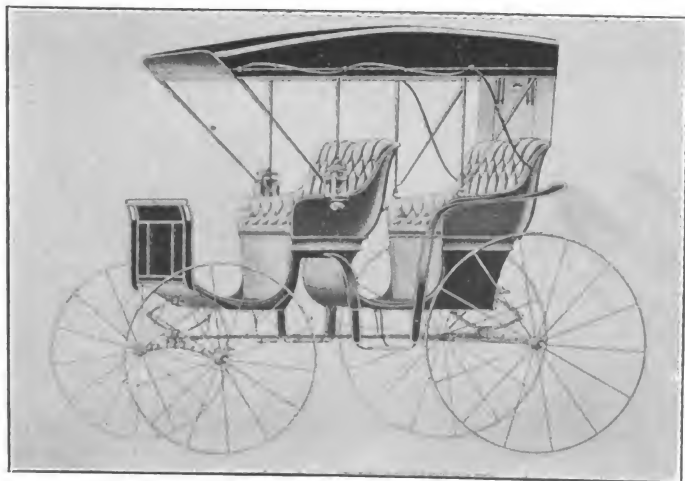
PETERS BUGGY CO.
Columbus, Ohio



PARRY MANUFACTURING CO.,
Indianapolis, Ind.



HACKNEY BROS.
Wilson, N. C.



MARSHALLTOWN BUGGY CO.
Marshalltown, Iowa



SAYERS & SCOVILL
Cincinnati, Ohio



EMERSON CARRIAGE CO.
Rockford, Ill.



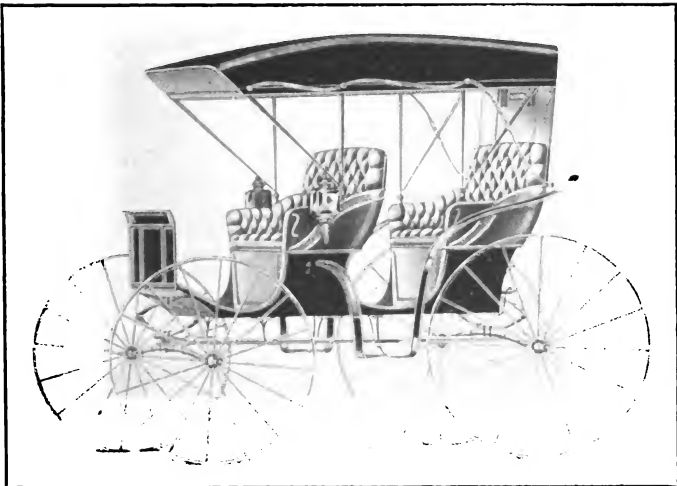
ZIMMERMAN MFG. CO
Auburn, Ind.



JOHN DEERE PLOW CO.
St. Louis, Mo.



DURANT-DORT CARRIAGE CO.
Flint, Mich.



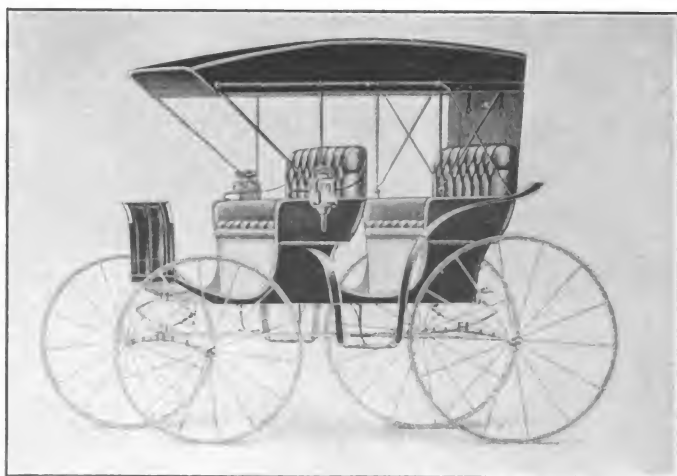
ZIMMERMAN MFG. CO
Auburn, Ind.



AMES-DEAN CARRIAGE CO.
Jackson, Mich.



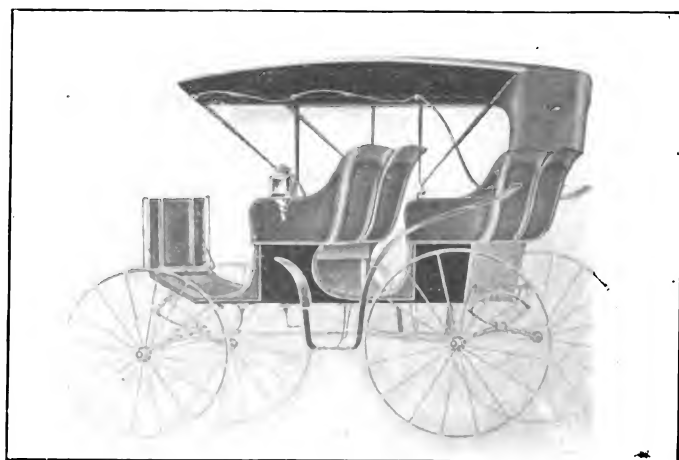
PETERS BUGGY CO.
Columbus, Ohio



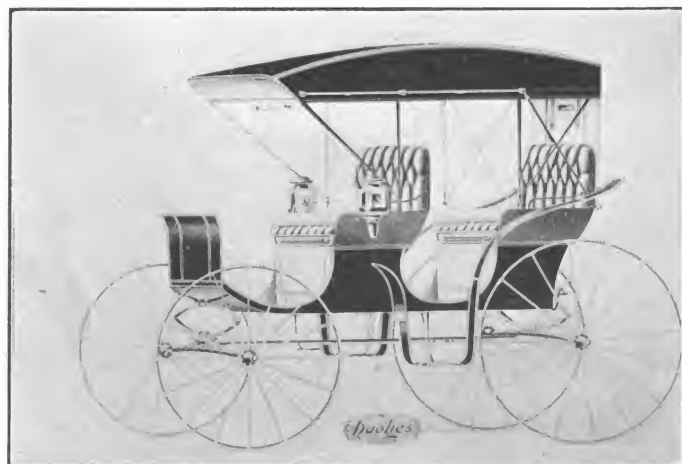
PETERS BUGGY CO.
Columbus, Ohio



RATTERMAN & LUTH
Cincinnati, Ohio



AHLBRAND CARRIAGE CO.
Seymour, Ind.

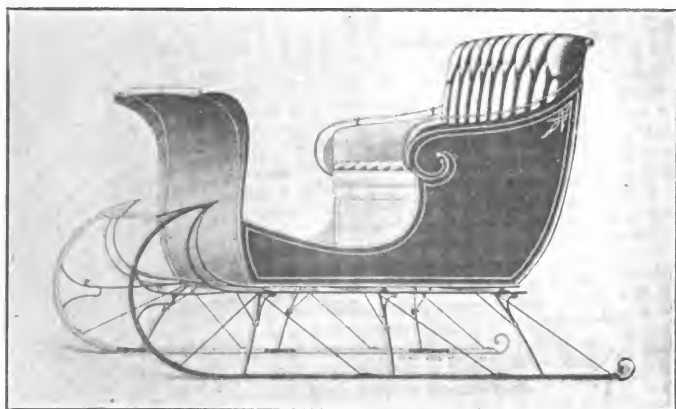


HUGHES BUGGY CO.
Lynchburg, Va.

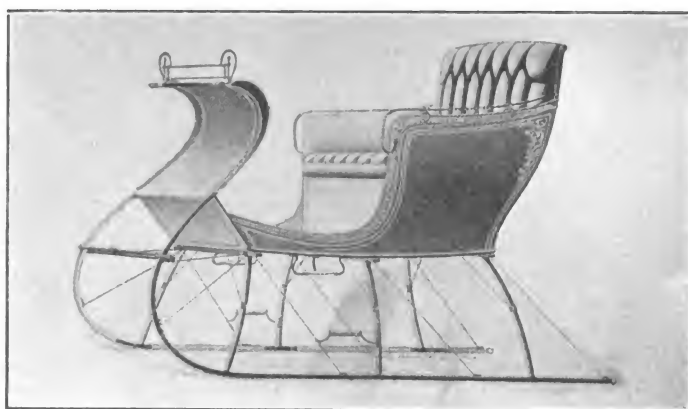


HIGH POINT BUGGY CO.
High Point, N. C.

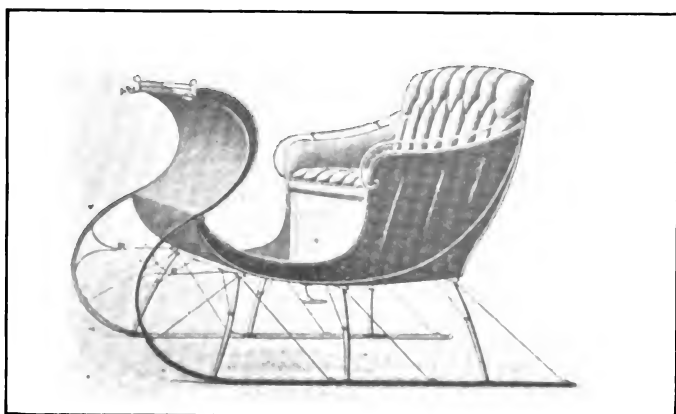
Sleighs



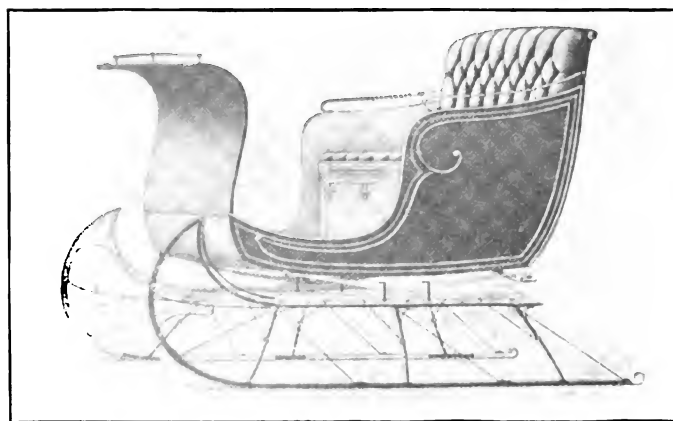
LULL CARRIAGE CO.
Kalamazoo, Mich.



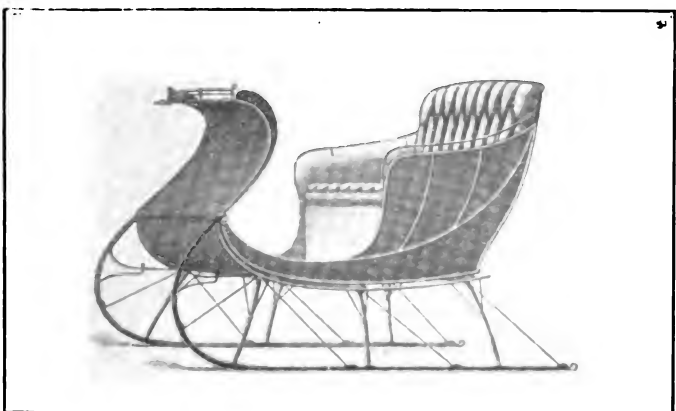
AMES-DEAN CARRIAGE CO.
Jackson, Mich.



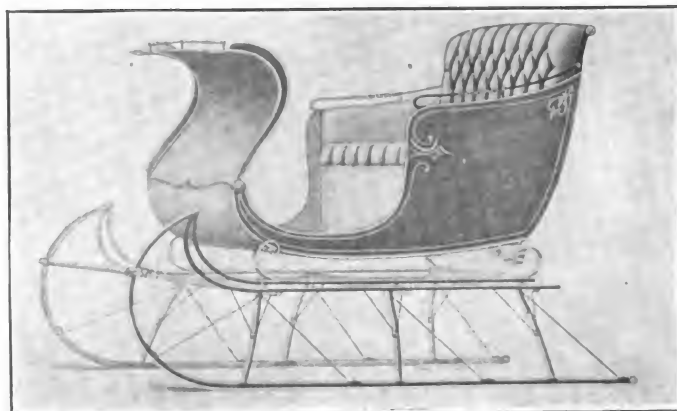
SULLIVAN BROS.
Rochester, N. Y.



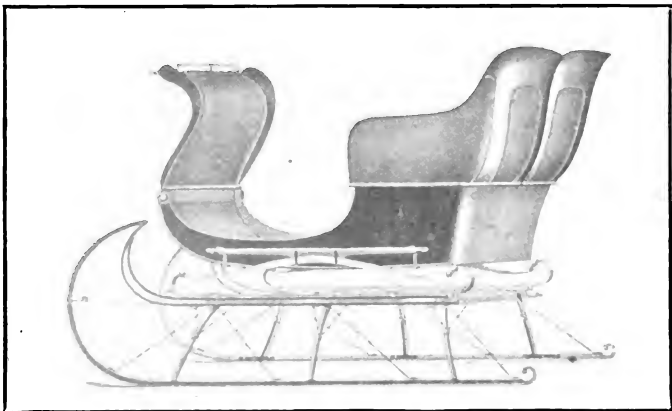
LULL CARRIAGE CO.
Kalamazoo, Mich.



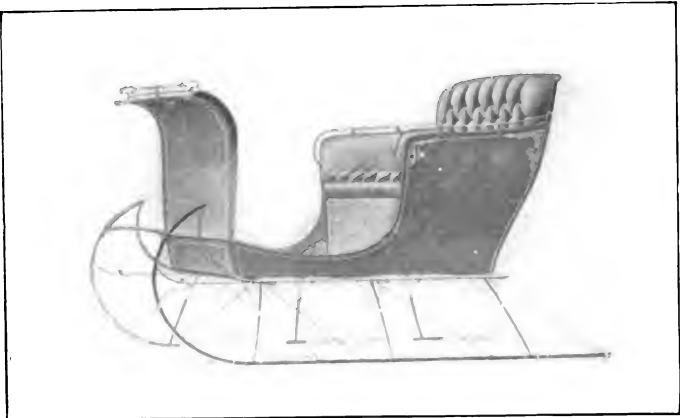
SULLIVAN BROS.
Rochester, N. Y.



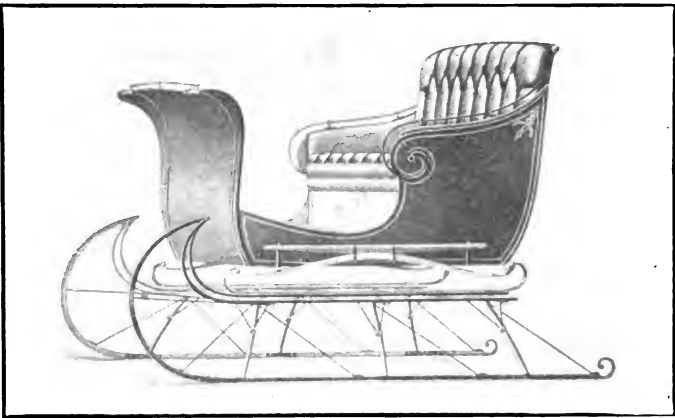
LULL CARRIAGE CO.
Kalamazoo, Mich.



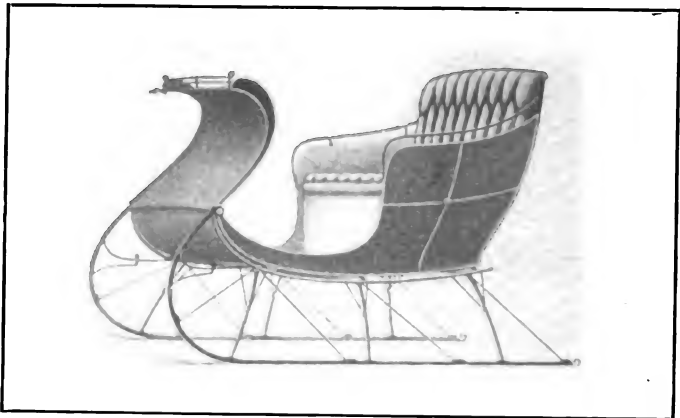
LULL CARRIAGE CO.
Kalamazoo, Mich.



AMES-DEAN CARRIAGE CO.
Jackson, Mich.



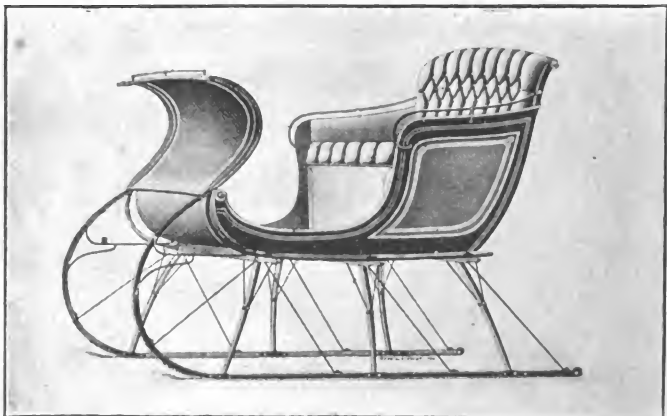
LULL CARRIAGE CO.
Kalamazoo, Mich.



SULLIVAN BROS.
Rochester, N. Y.



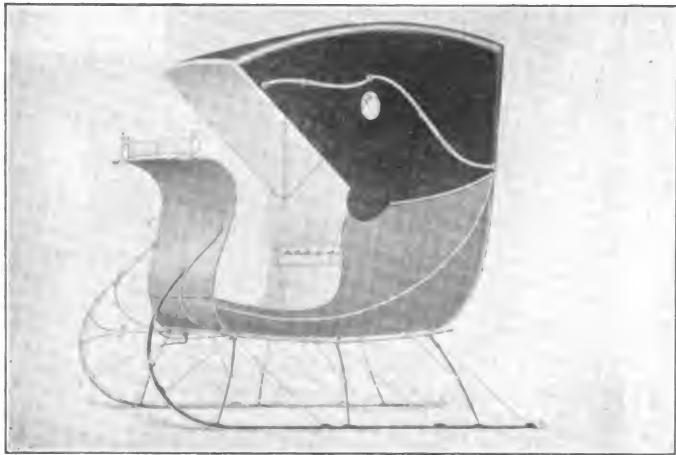
SULLIVAN BROS.
Rochester, N. Y.



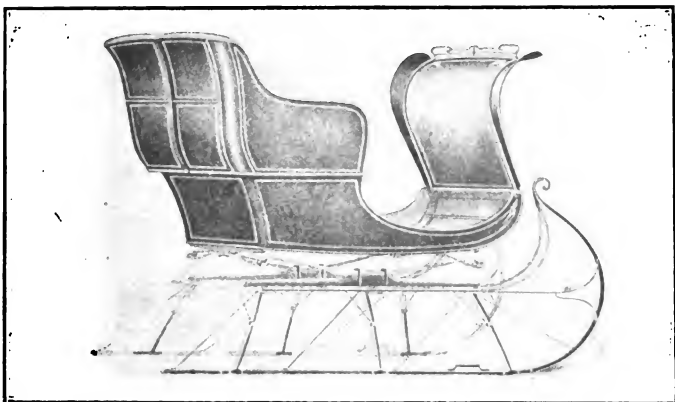
LULL CARRIAGE CO.
Kalamazoo, Mich.



AMES-DEAN CARRIAGE CO.
Jackson, Mich.



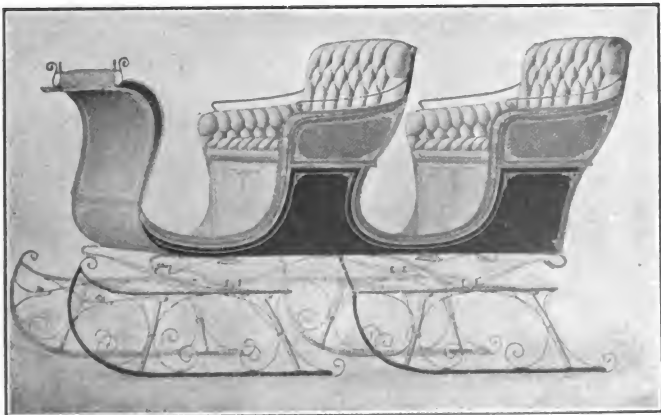
SULLIVAN BROS.
Rochester, N. Y.



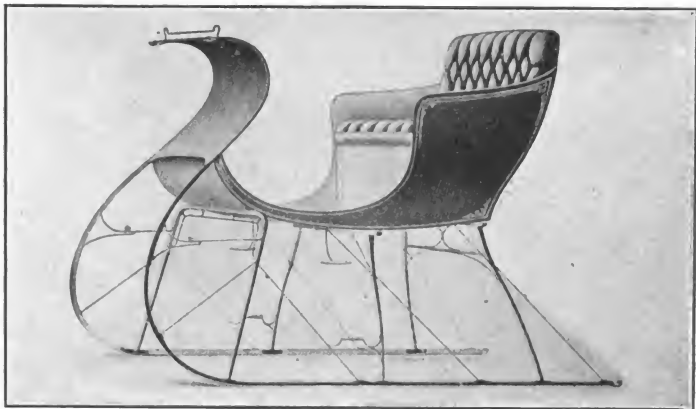
AMES-DEAN CARRIAGE CO.
Jackson, Mich.



PROUTY & GLASS CARRIAGE CO.
Wayne, Mich.

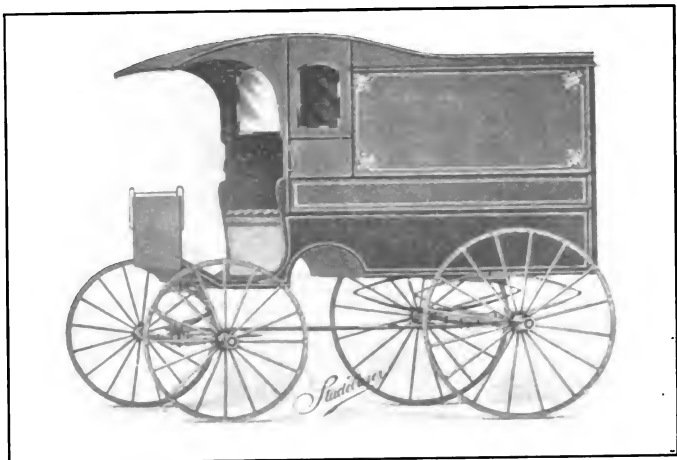


AMES-DEAN CARRIAGE CO.
Jackson, Mich.

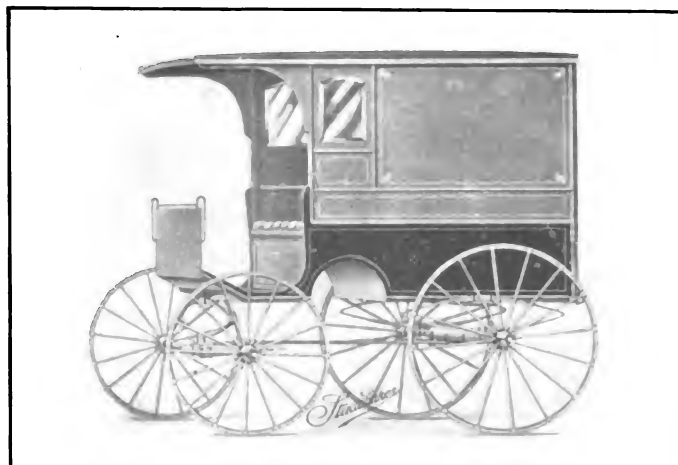


AMES-DEAN CARRIAGE CO.
Jackson, Mich.

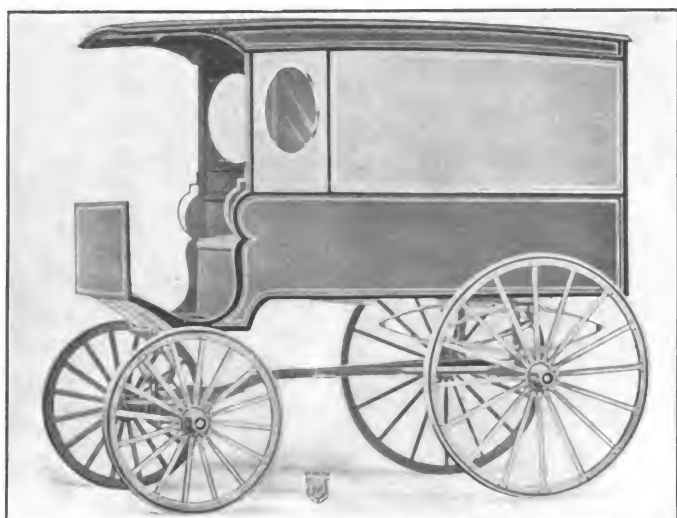
Business Wagons



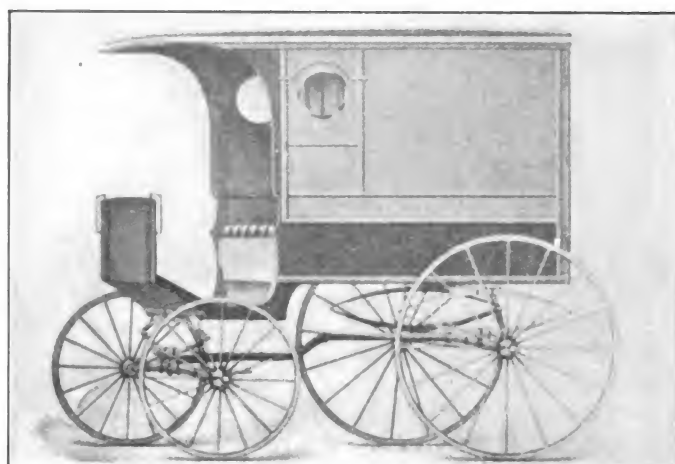
STUDEBAKER CORPORATION
South Bend, Ind.



STUDEBAKER CORPORATION
South Bend, Ind.



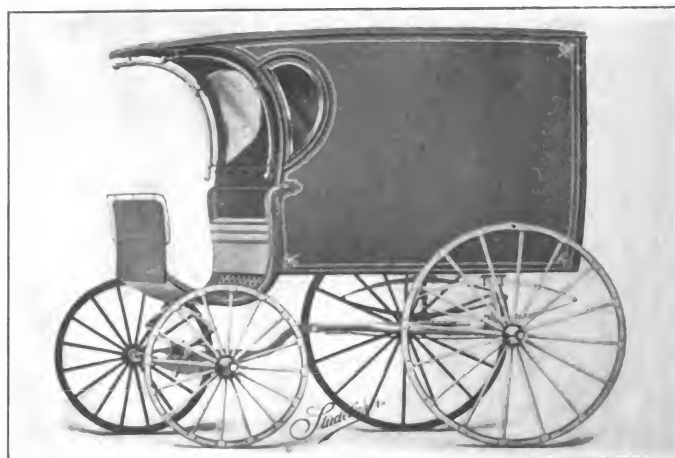
MILBURN WAGON CO.
Toledo, Ohio



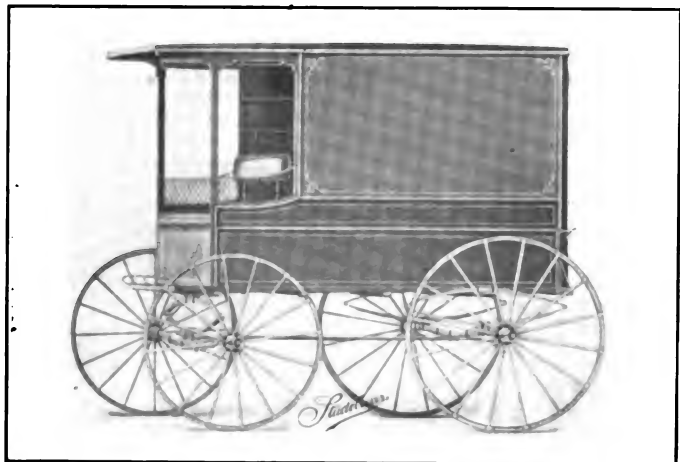
DURANT-DORT CARRIAGE CO.
Flint, Mich.



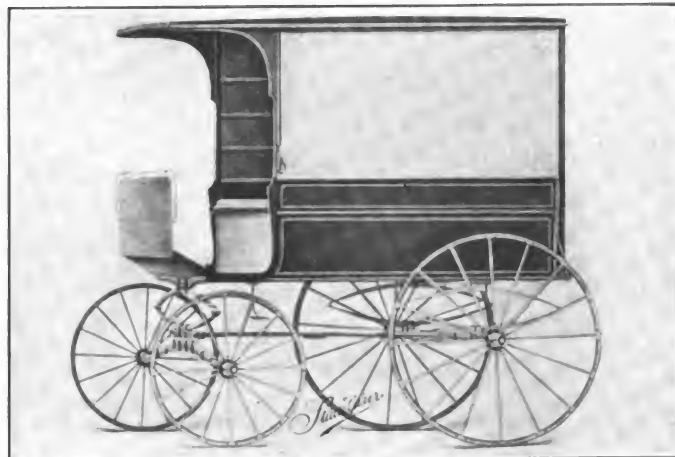
STUDEBAKER CORPORATION
South Bend, Ind.



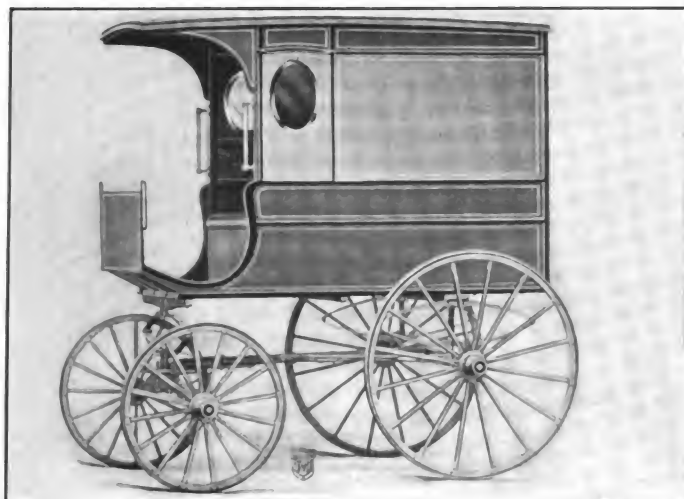
STUDEBAKER CORPORATION
South Bend, Ind.



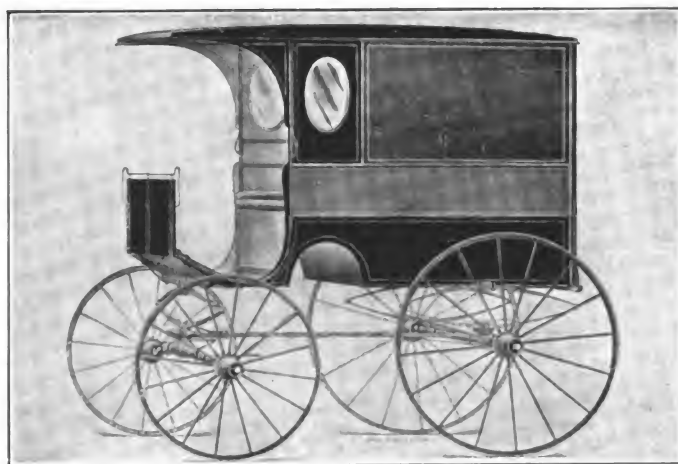
STUDEBAKER CORPORATION
South Bend, Ind.



STUDEBAKER CORPORATION
South Bend, Ind.



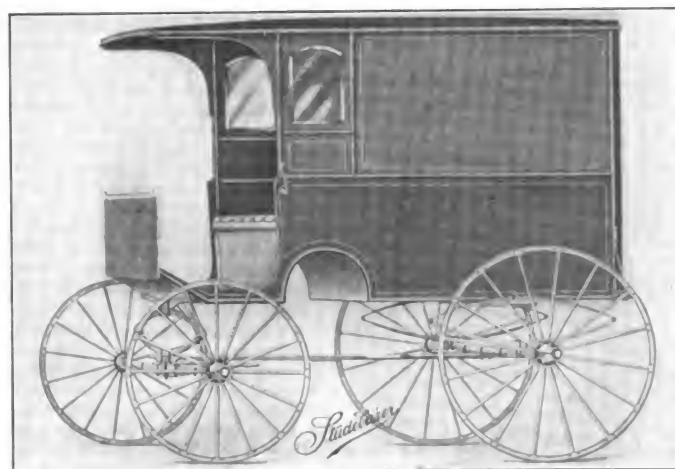
MILBURN WAGON CO.
Toledo, Ohio



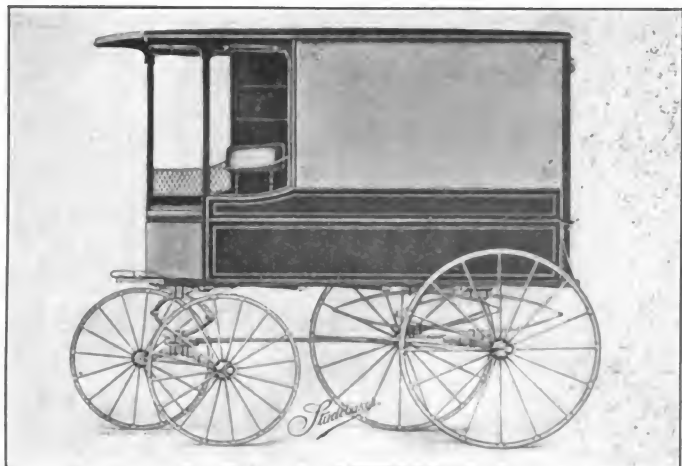
WINKLER BROS. MFG. CO.
South Bend, Ind.



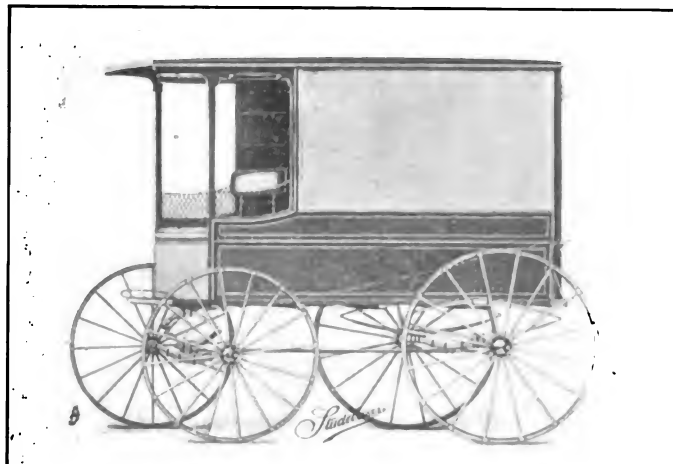
STUDEBAKER CORPORATION
South Bend, Ind.



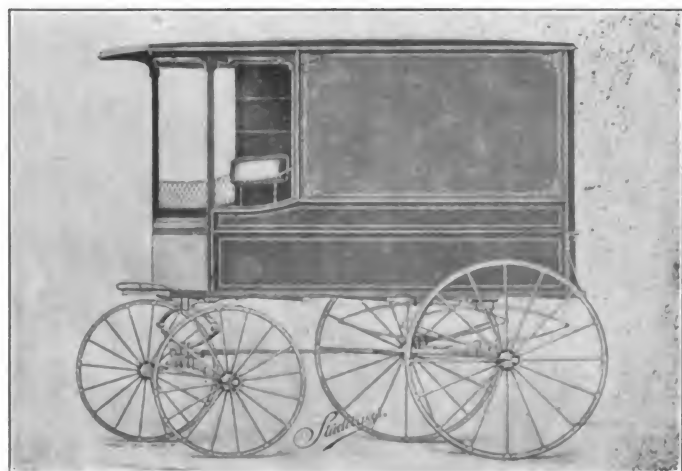
STUDEBAKER CORPORATION
South Bend, Ind.



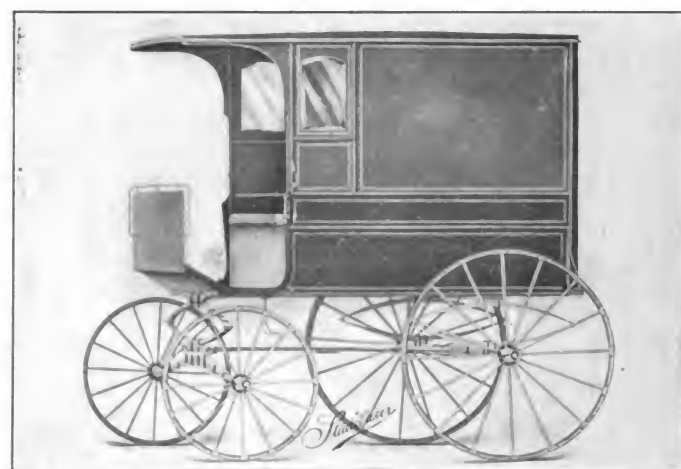
STUDEBAKER CORPORATION
South Bend, Ind.



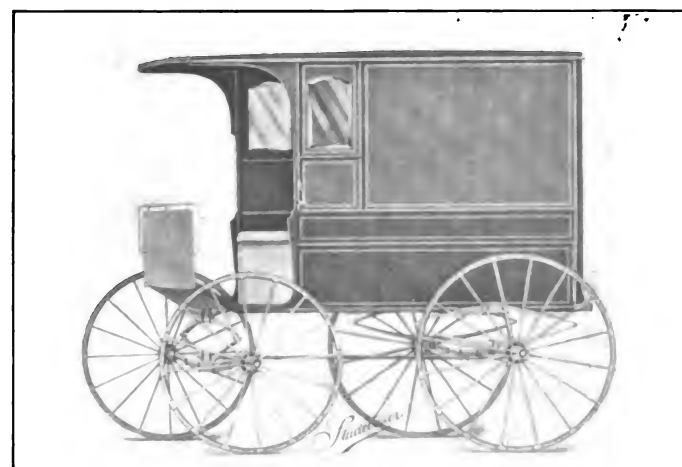
STUDEBAKER CORPORATION
South Bend, Ind.



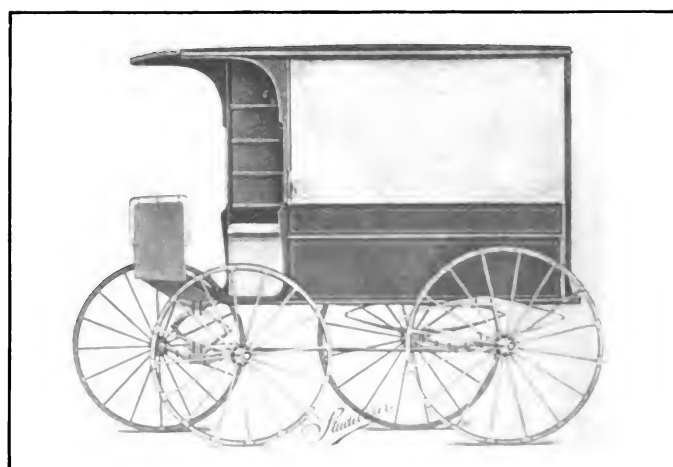
STUDEBAKER CORPORATION
South Bend, Ind.



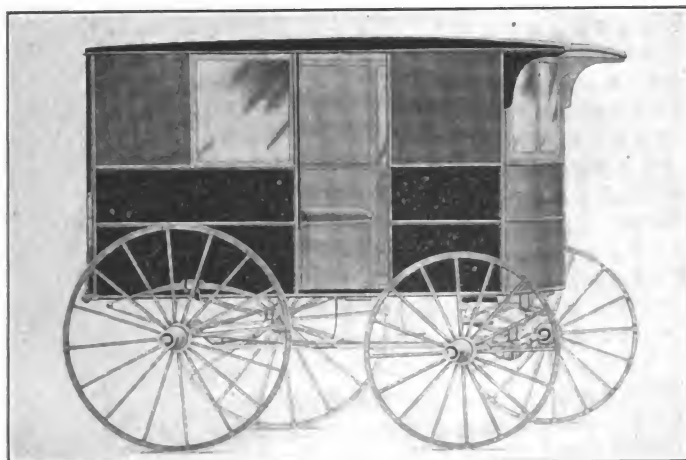
STUDEBAKER CORPORATION
South Bend, Ind.



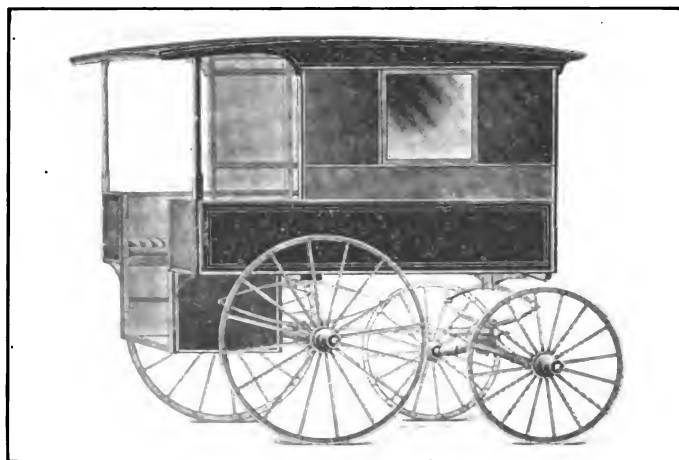
STUDEBAKER CORPORATION
South Bend, Ind.



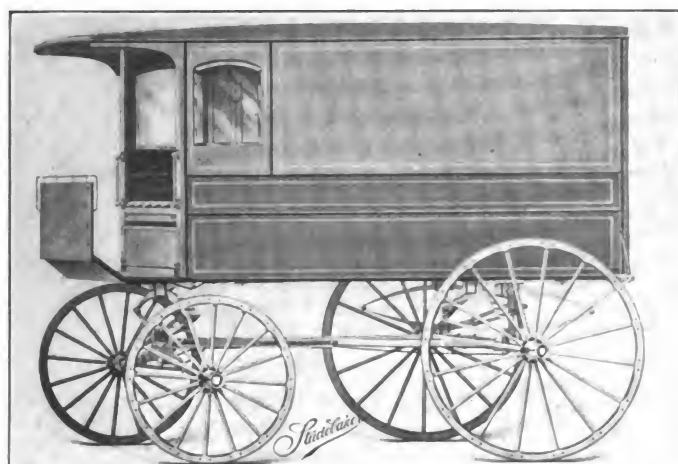
STUDEBAKER CORPORATION
South Bend, Ind.



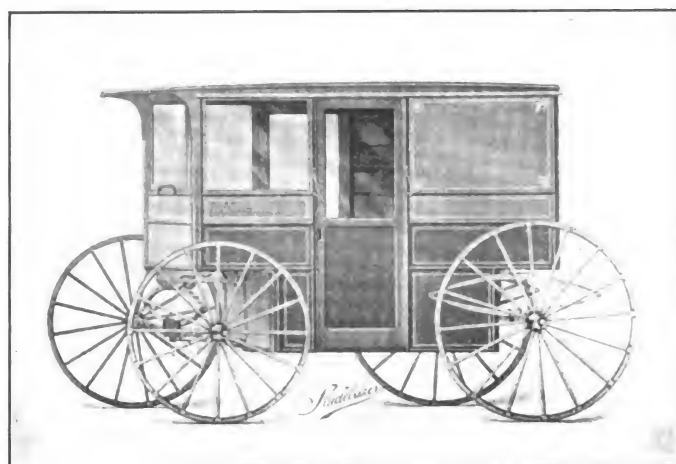
WINKLER BROS. MFG. CO.
South Bend, Ind.



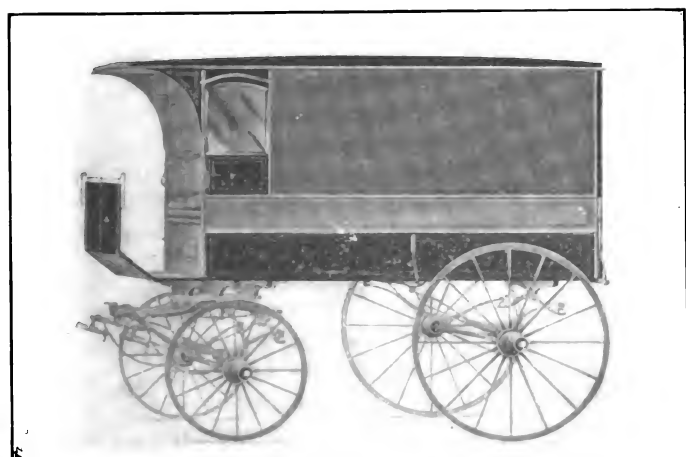
WINKLER BROS. MFG. CO.
South Bend, Ind.



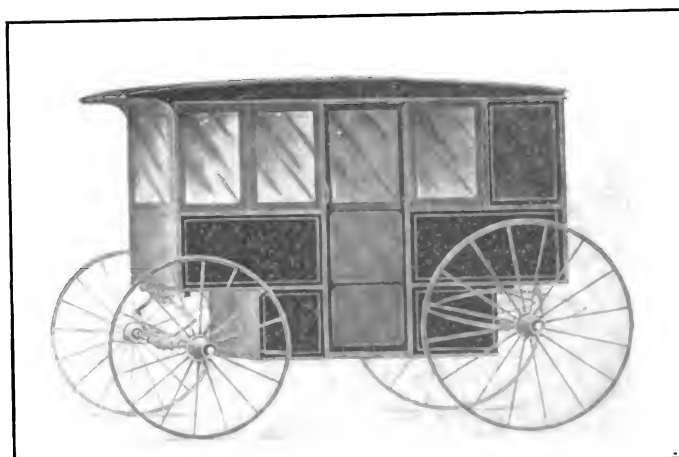
STUDEBAKER CORPORATION
South Bend, Ind.



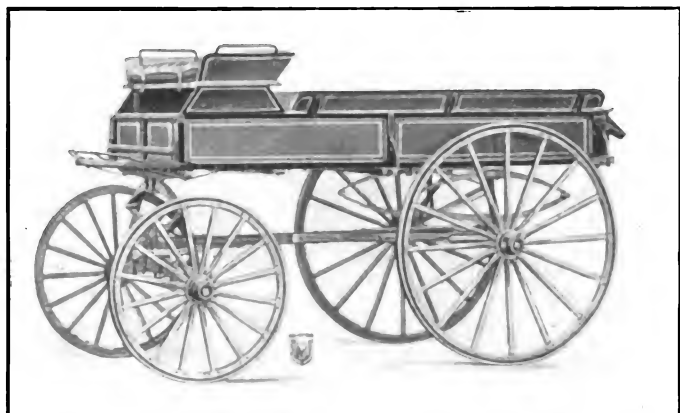
STUDEBAKER CORPORATION
South Bend, Ind.



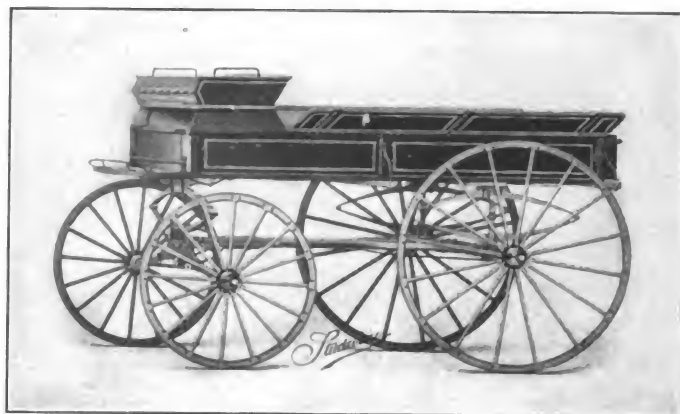
WINKLER BROS. MFG. CO.
South Bend, Ind.



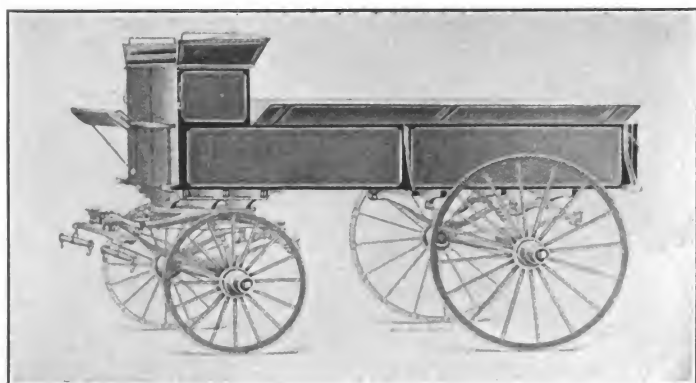
WINKLER BROS. MFG. CO.
South Bend, Ind.



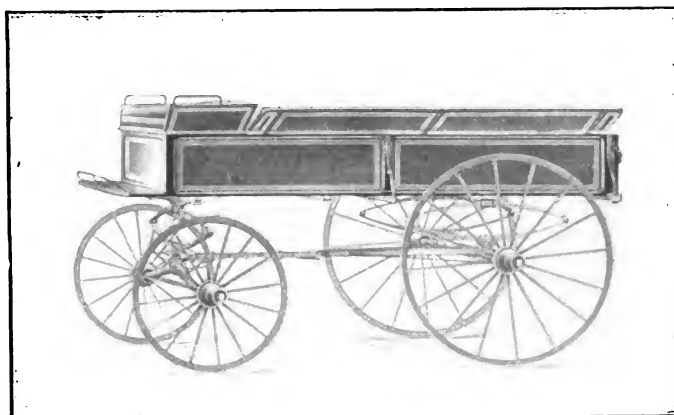
MILBURN WAGON CO.
Toledo, Ohio



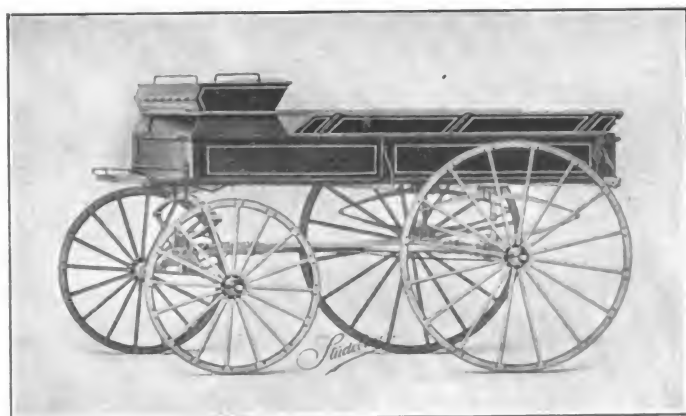
STUDEBAKER CORPORATION
South Bend, Ind.



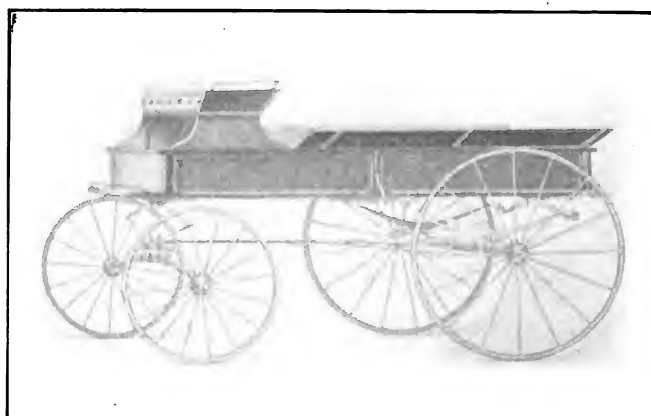
WINKLER BROS. MFG. CO.
South Bend, Ind.



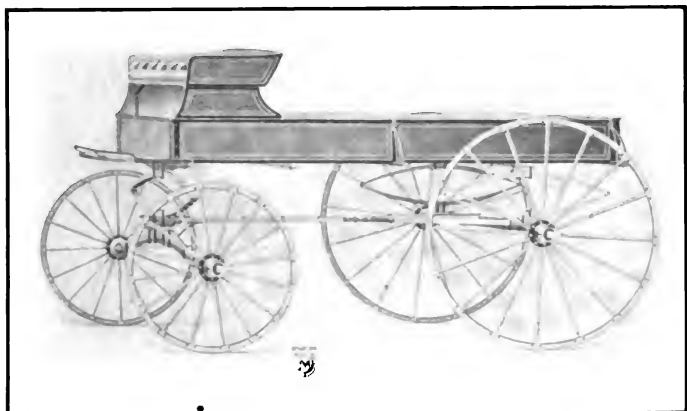
WINKLER BROS. MFG. CO.
South Bend, Ind.



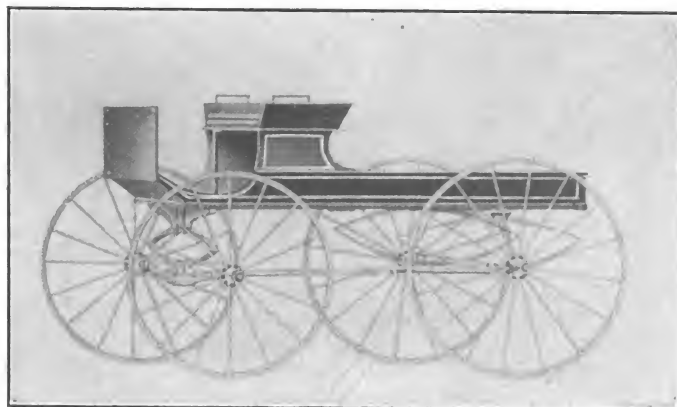
STUDEBAKER CORPORATION
South Bend, Ind.



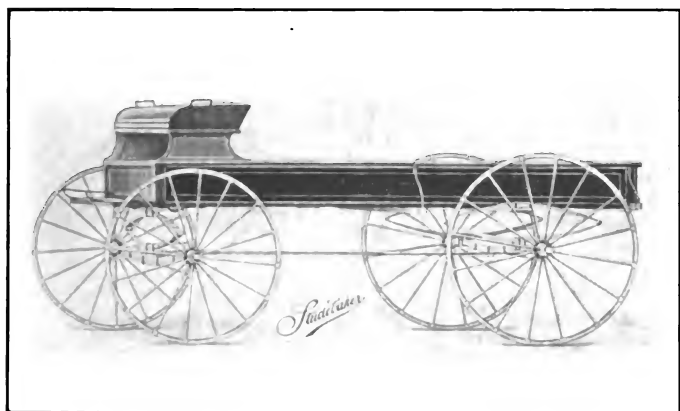
DURANT-DORT CARRIAGE CO.
Flint, Mich.



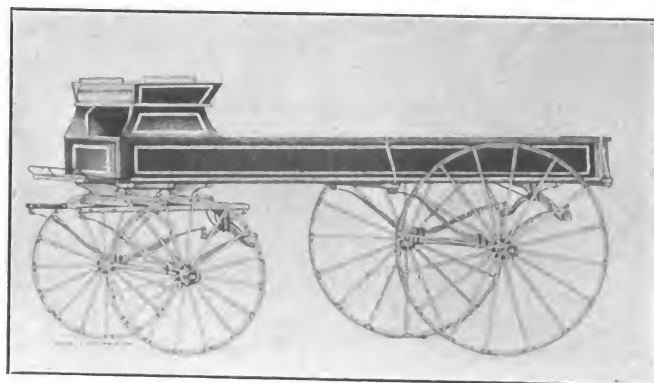
MILBURN WAGON CO.
Toledo, Ohio



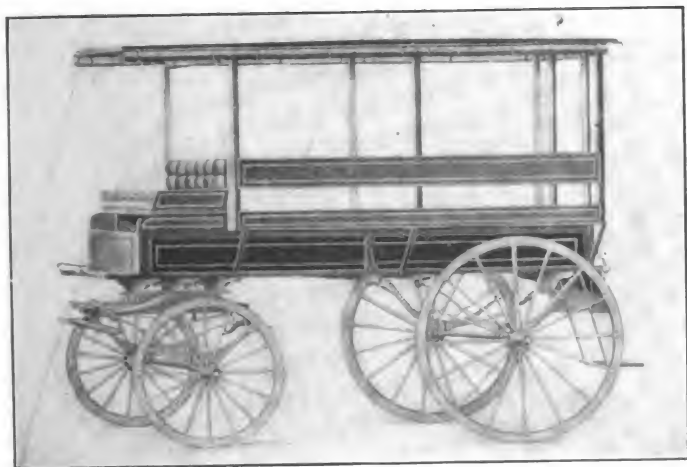
WINKLER BROS. MFG. CO.
South Bend, Ind.



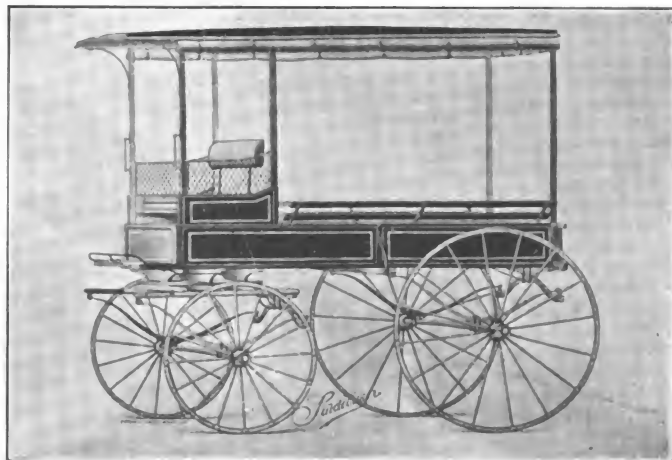
STUDEBAKER CORPORATION
South Bend, Ind.



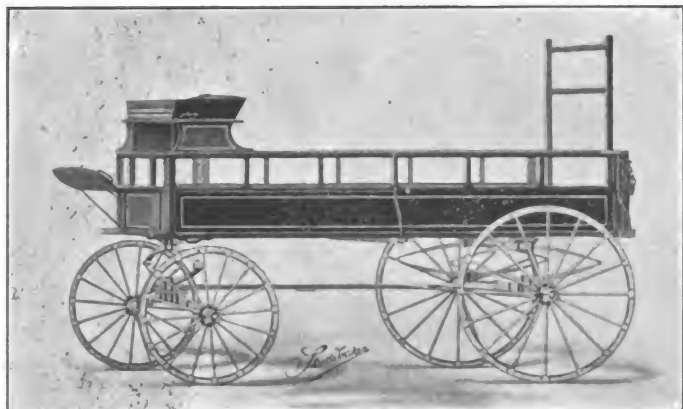
WINKLER BROS. MFG. CO.
South Bend, Ind.



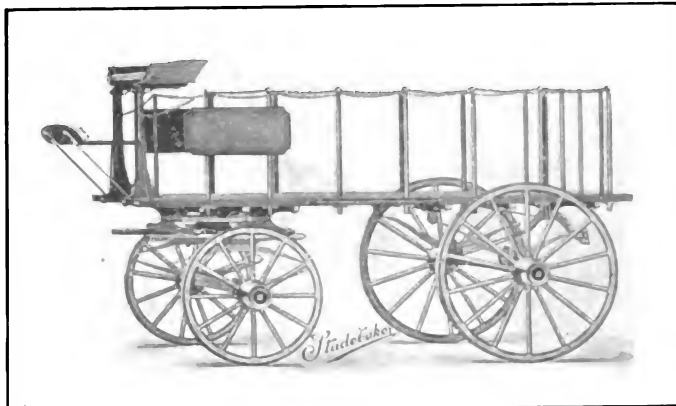
WINKLER BROS. MFG. CO.
South Bend, Ind.



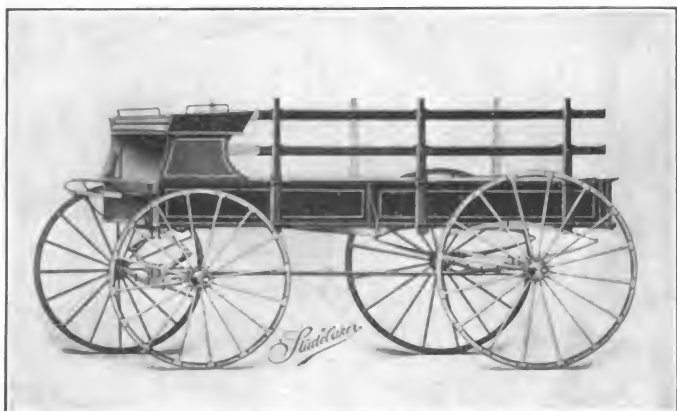
STUDEBAKER CORPORATION
South Bend, Ind.



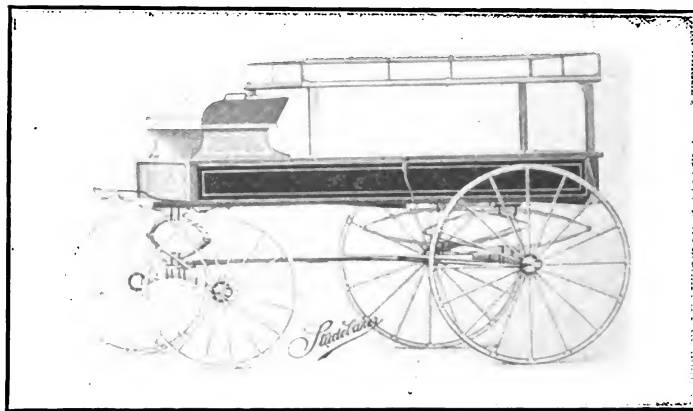
STUDEBAKER CORPORATION
South Bend, Ind.



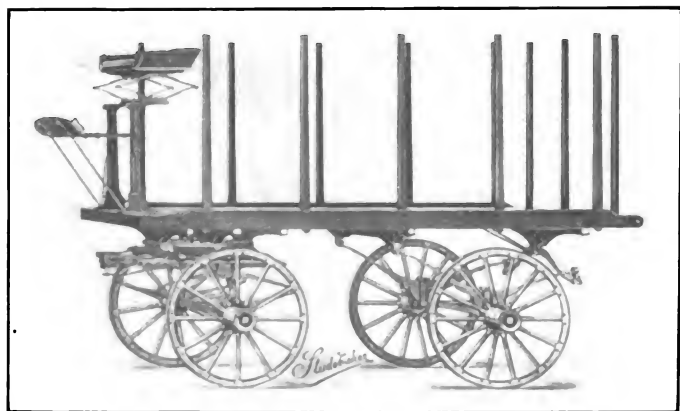
South Bend, Ind.
STUDEBAKER CORPORATION



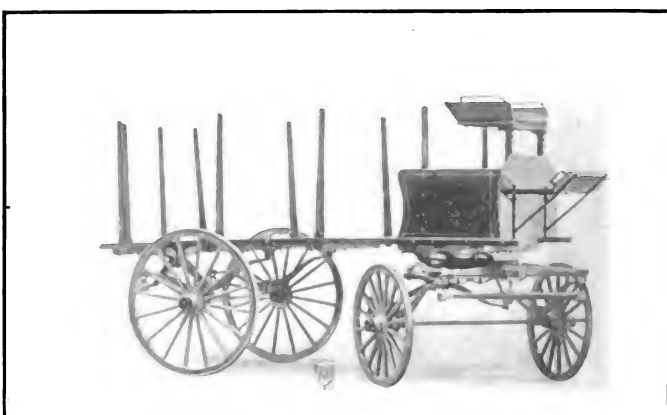
STUDEBAKER CORPORATION
South Bend, Ind.



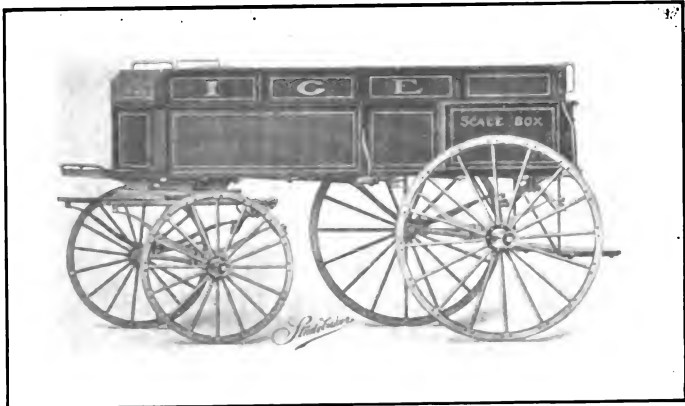
STUDEBAKER CORPORATION
South Bend, Ind.



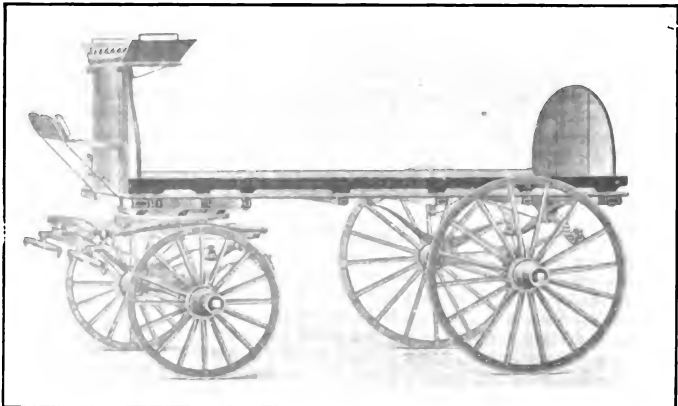
STUDEBAKER CORPORATION
South Bend, Ind.



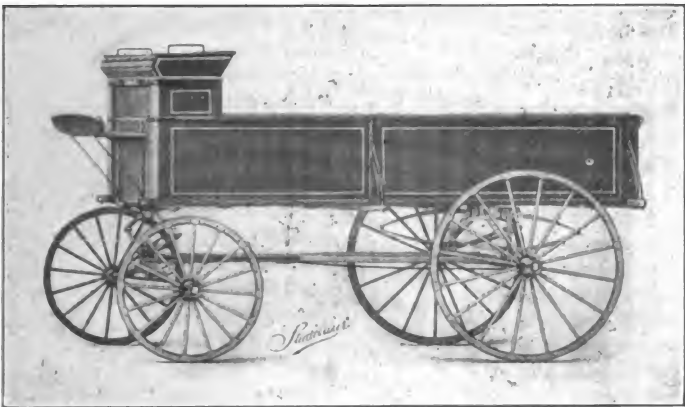
MILBURN WAGON CO.
Toledo, Ohio



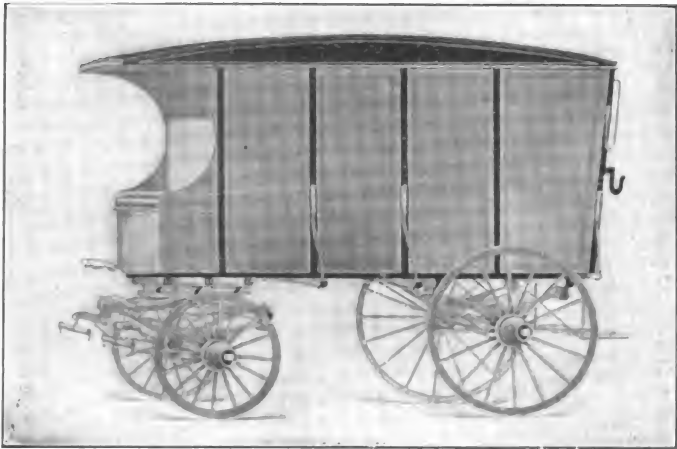
STUDEBAKER CORPORATION
South Bend, Ind.



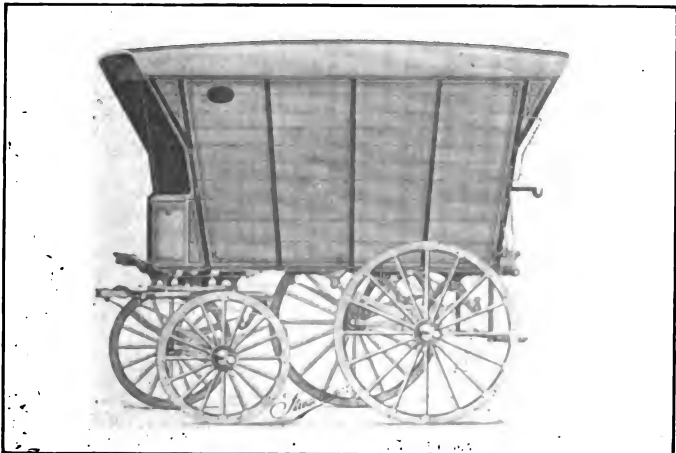
WINKLER BROS. MFG. CO.
South Bend, Ind.



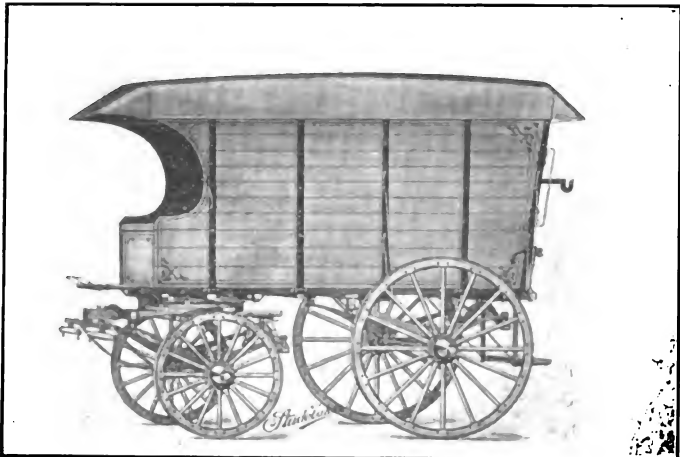
STUDEBAKER CORPORATION
South Bend, Ind.



WINKLER BROS. MFG. CO.
South Bend, Ind.



STUDEBAKER CORPORATION
South Bend, Ind.



STUDEBAKER CORPORATION
South Bend, Ind.

Omnibuses



JANESVILLE CARRIAGE WORKS
Janesville, Wis.



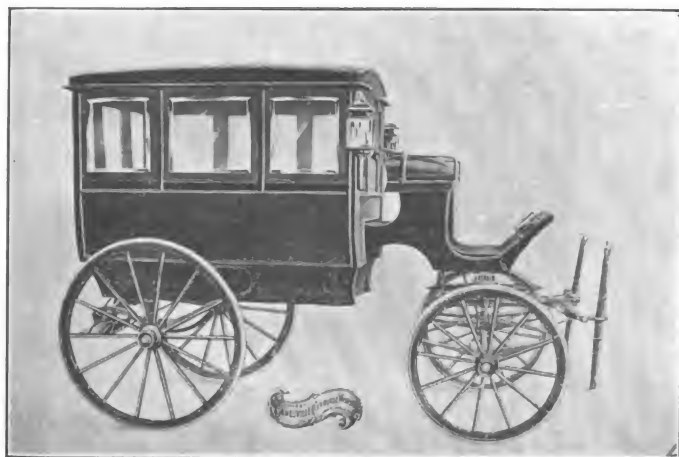
JANESVILLE CARRIAGE WORKS
Janesville, Wis.



JANESVILLE CARRIAGE WORKS
Janesville, Wis.



JANESVILLE CARRIAGE WORKS
Janesville, Wis.

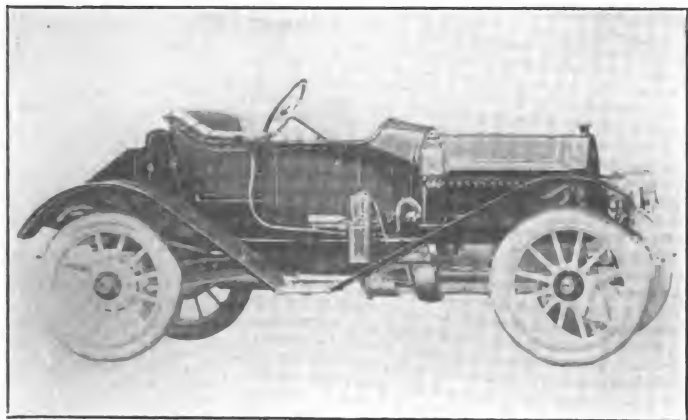


JANESVILLE CARRIAGE WORKS
Janesville, Wis.

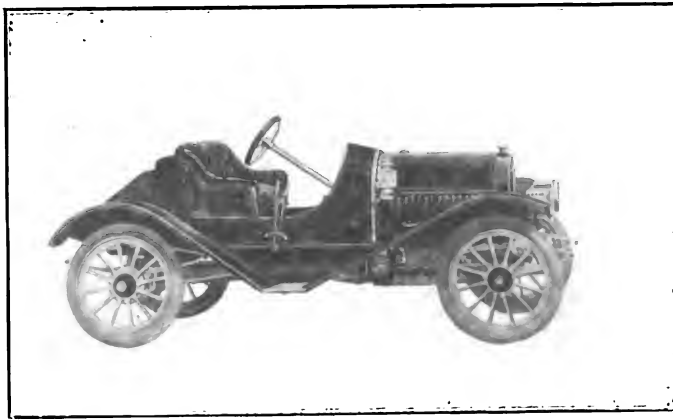


JANESVILLE CARRIAGE WORKS
Janesville, Wis.

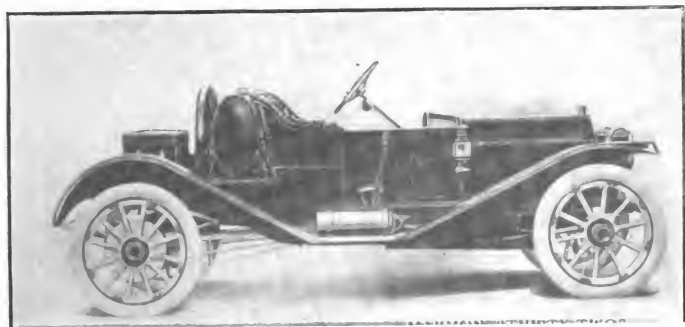
Gasoline Automobiles



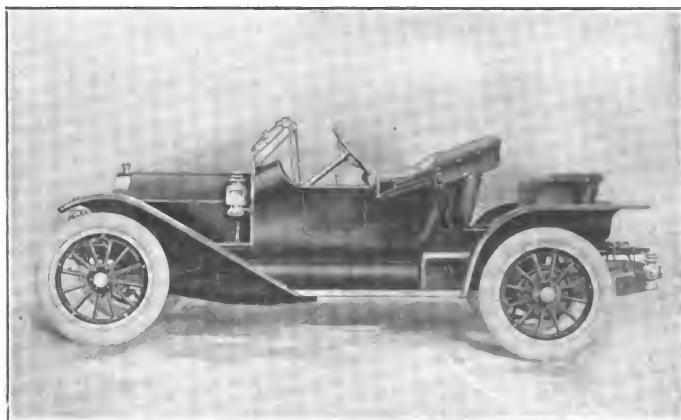
JACKSON AUTOMOBILE CO.
Jackson, Mich.



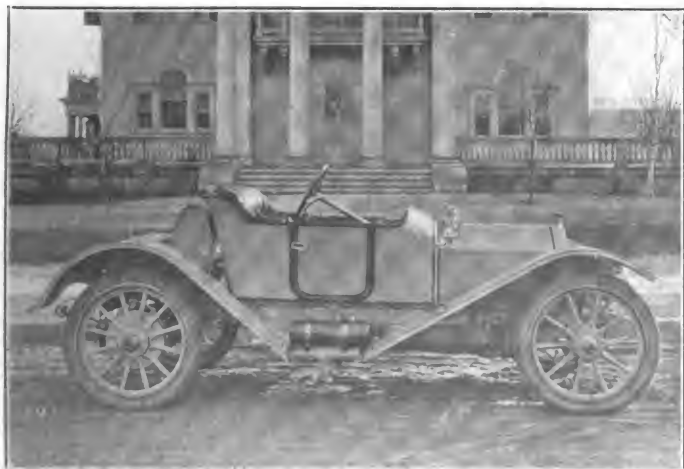
JACKSON AUTOMOBILE CO.
Jackson, Mich.



NORDYKE & MARMON CO.
Indianapolis, Ind.



KNOX AUTOMOBILE CO.
Springfield, Mass.



PULLMAN MOTOR CAR CO.
York, Pa.



DURYEA AUTO CO.
Saginaw, Mich.



GREAT WESTERN AUTOMOBILE CO.
Peru, Ind.



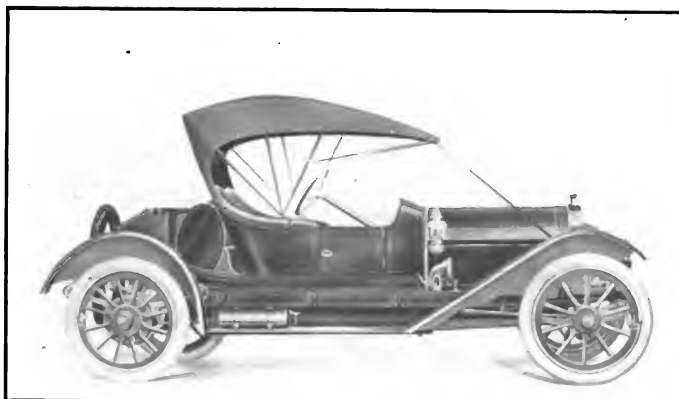
KEARNS MOTOR CAR CO.
Beavertown, Pa.



BUCKEYE MFG. CO.
Anderson, Ind.



AUBURN AUTOMOBILE CO.
Auburn, Ind.



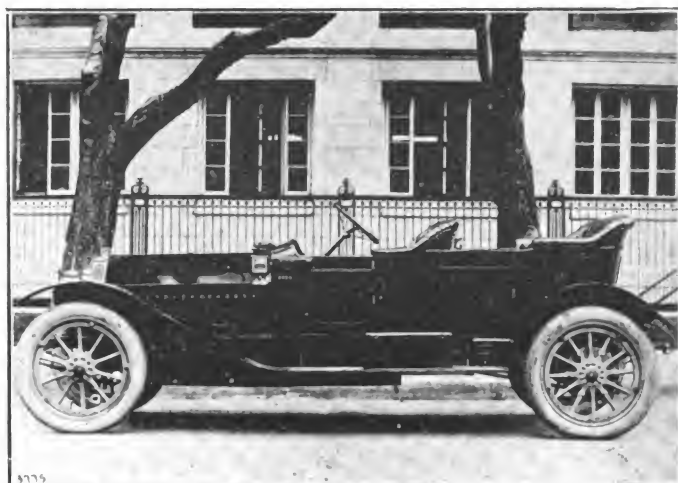
McFARLAN MOTOR CAR CO.
Connersville, Ind.



AMERICAN MOTORS CO.
Indianapolis, Ind.



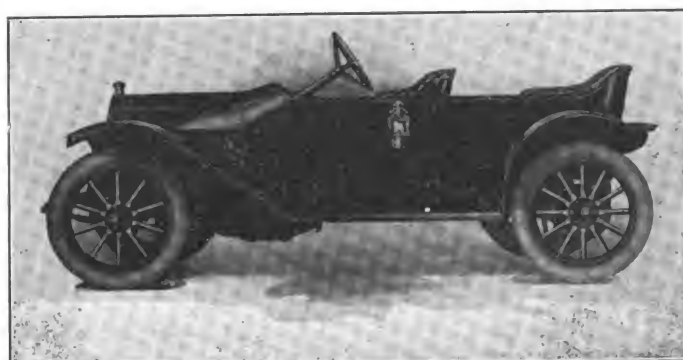
SPEEDWELL MOTOR CAR CO.
Dayton, Ohio



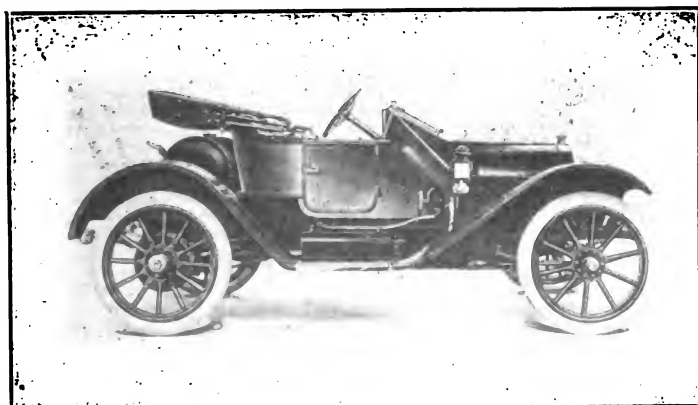
PREMIER MOTOR MFG. CO.
Indianapolis, Ind.



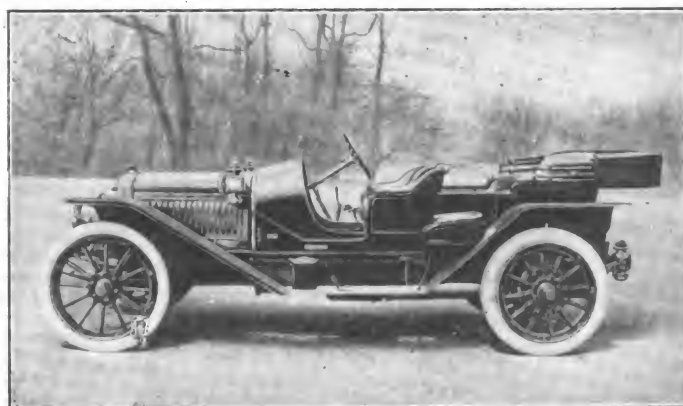
LION MOTOR CAR CO.
Adrian, Mich.



KING MOTOR CAR CO.
Detroit, Mich.



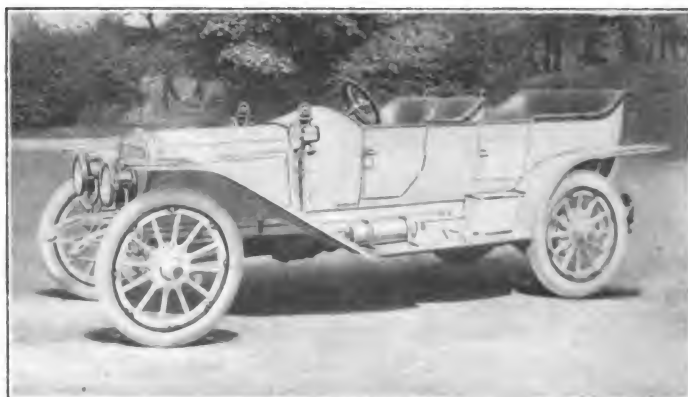
CHALMERS MOTOR CO.
Detroit, Mich.



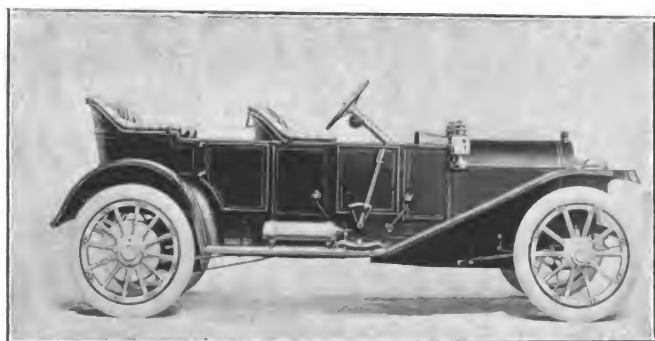
LOZIER MOTOR CO.
Detroit, Mich.



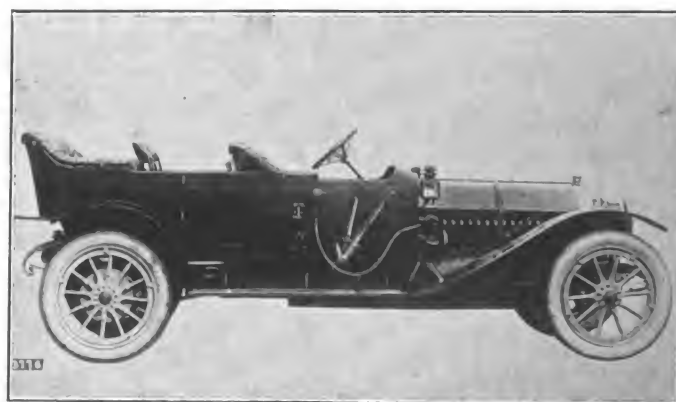
LOZIER MOTOR CO.
Detroit, Mich.



LOZIER MOTOR CO.
Detroit, Mich.



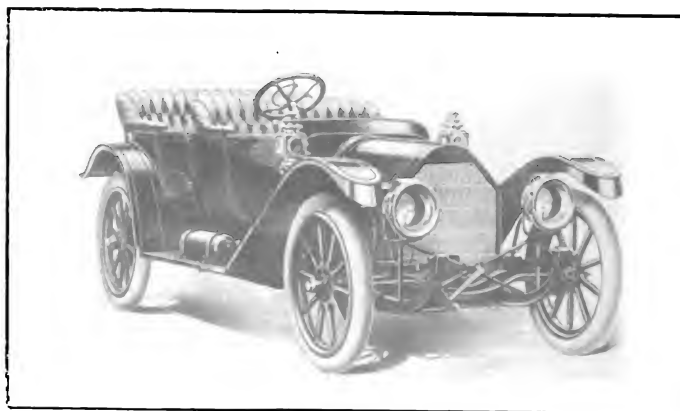
NORDYKE & MARMON CO.
Indianapolis, Ind.



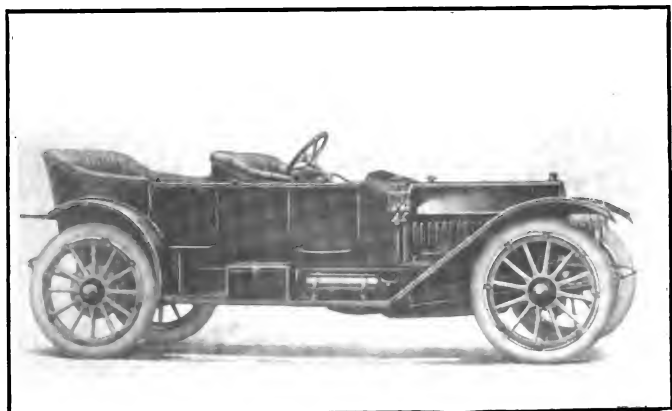
PREMIER MOTOR MFG. CO.
Indianapolis, Ind.



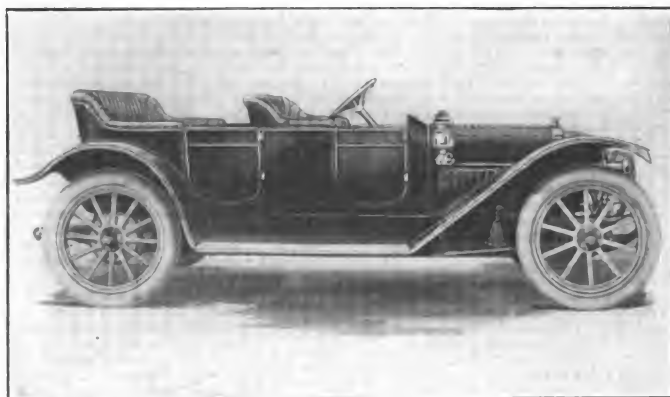
COLBY MOTOR CO.
Mason City, Iowa



REGAL MOTOR CAR CO.
Detroit, Mich.



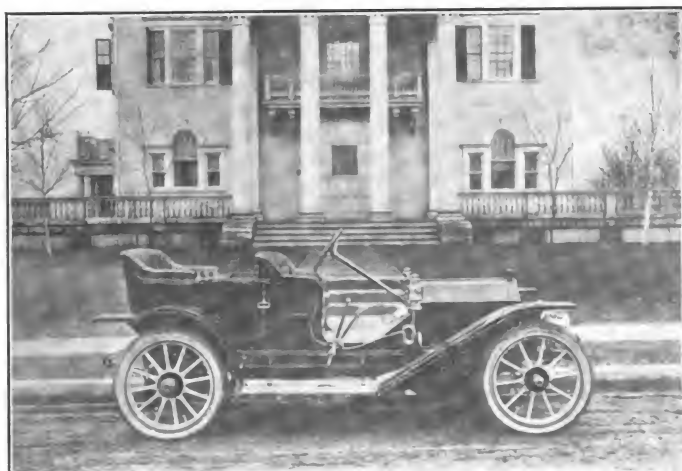
JACKSON AUTOMOBILE CO.
Jackson, Mich.



REGAL MOTOR CAR CO.
Detroit, Mich.



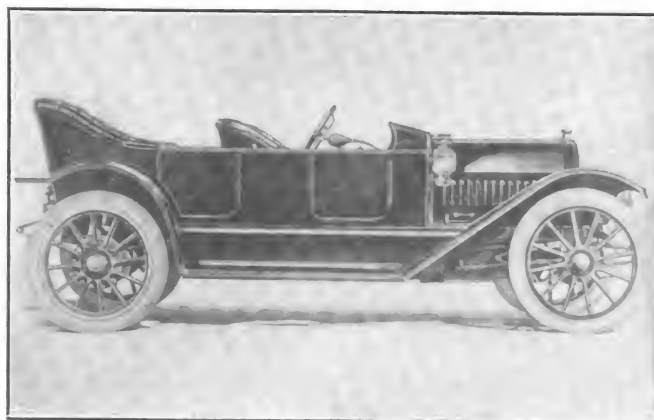
PULLMAN MOTOR CAR CO.
York, Pa.



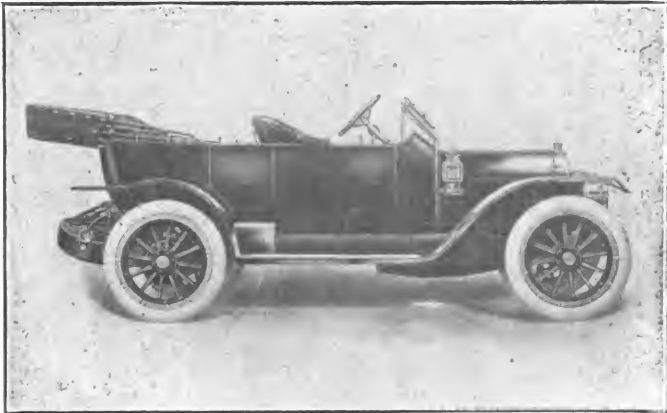
PULLMAN MOTOR CAR CO.
York, Pa.



AUBURN AUTOMOBILE CO.
Auburn, Ind.



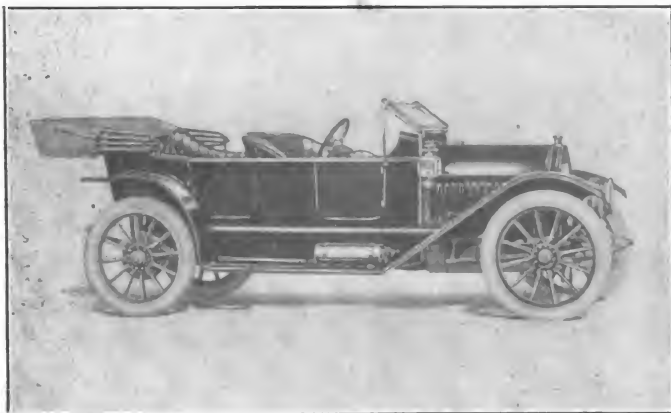
JACKSON AUTOMOBILE CO.
Jackson, Mich.



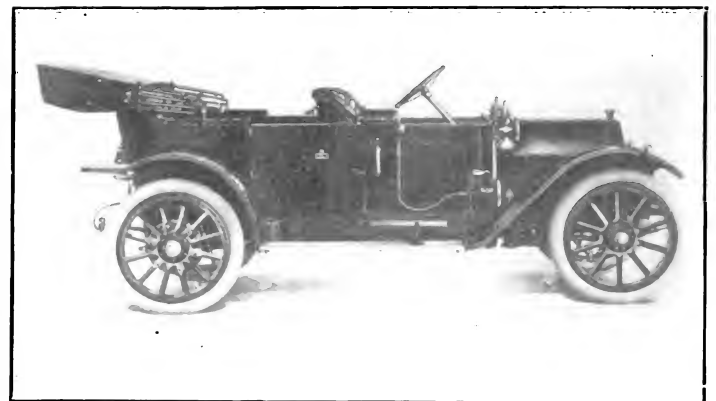
KNOX AUTOMOBILE CO.
Springfield, Mass.



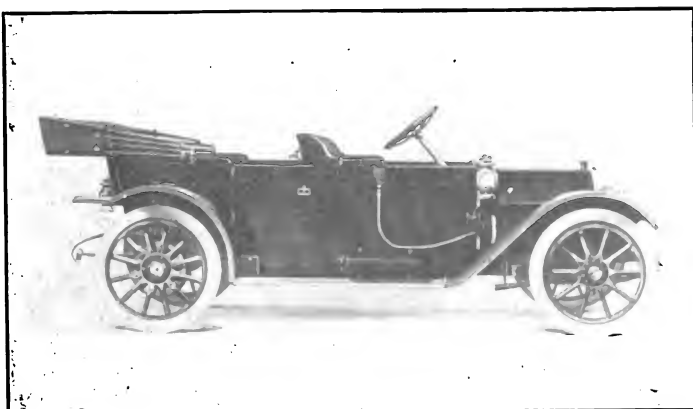
SPEEDWELL MOTOR CAR CO.
Dayton, Ohio



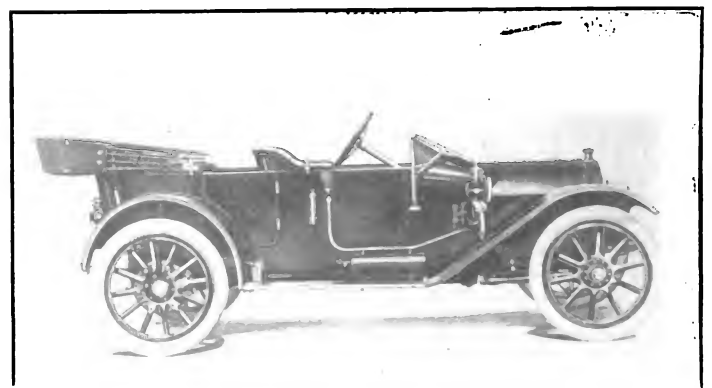
JACKSON AUTOMOBILE CO.
Jackson, Mich.



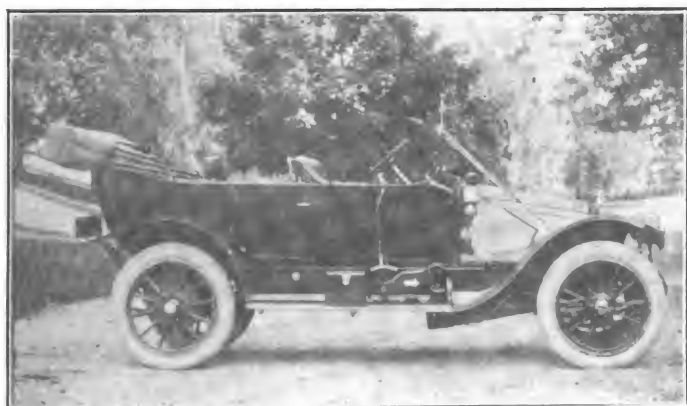
CHALMERS MOTOR CO.
Detroit, Mich.



CHALMERS MOTOR CO.
Detroit, Mich.



CHALMERS MOTOR CO.
Detroit, Mich.



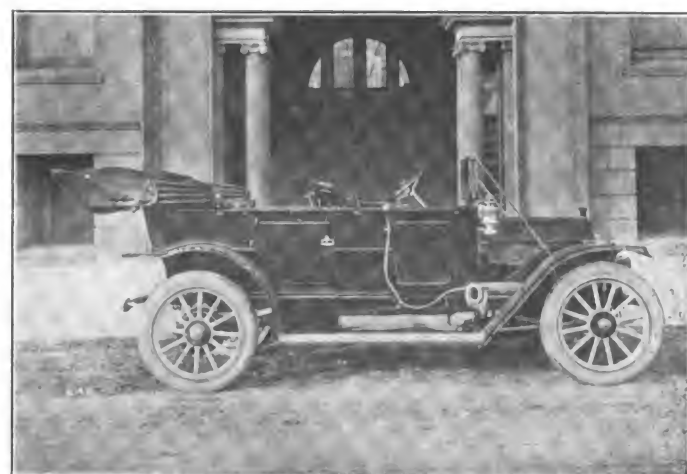
FRANKLIN AUTOMOBILE CO.
Syracuse, N. Y.



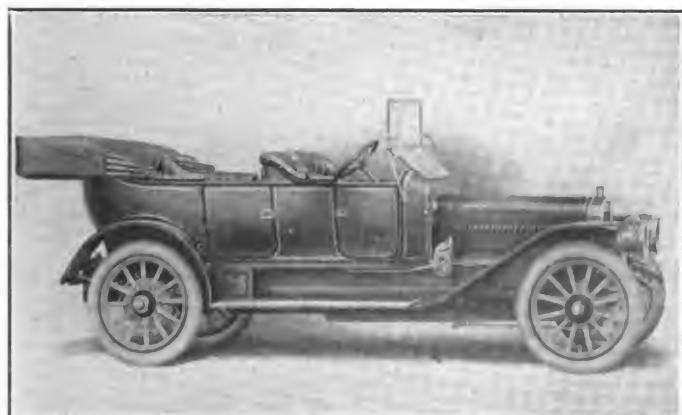
FRANKLIN AUTOMOBILE CO.
Syracuse, N. Y.



COLBY MOTOR CO.
Mason City, Iowa



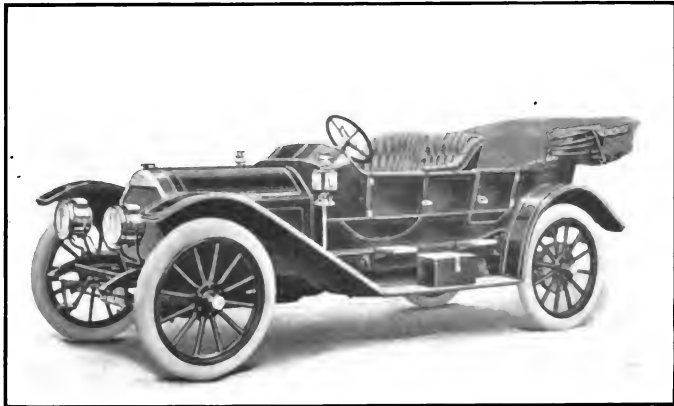
PULLMAN MOTOR CAR CO.
York, Pa.



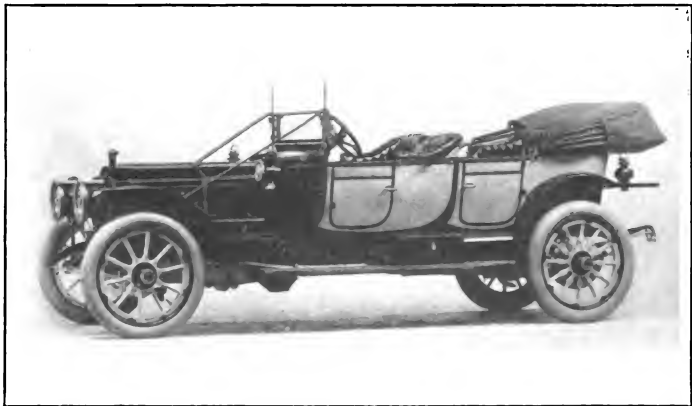
WINTON MOTOR CAR CO.
Cleveland, Ohio



H. A. MOYER
Syracuse, N. Y.



McFARLAN MOTOR CAR CO.
Connersville, Ind.



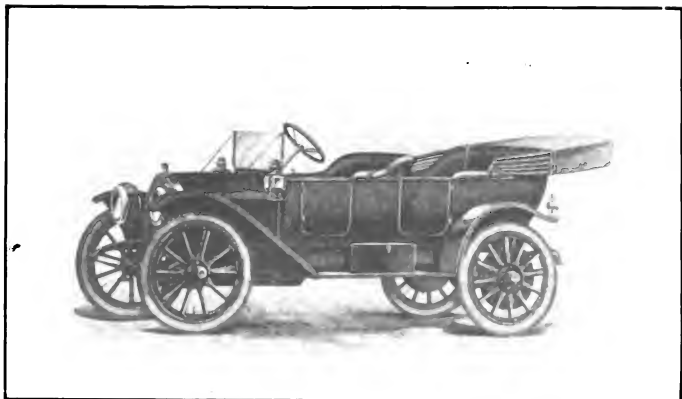
PACKARD MOTOR CAR CO.
Detroit, Mich.



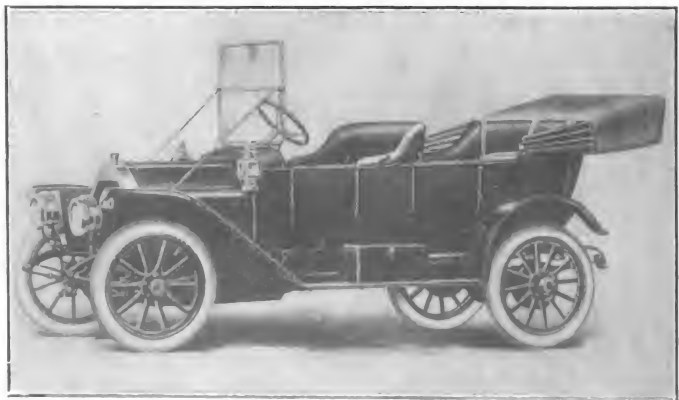
PULLMAN MOTOR CAR CO.
York, Pa.



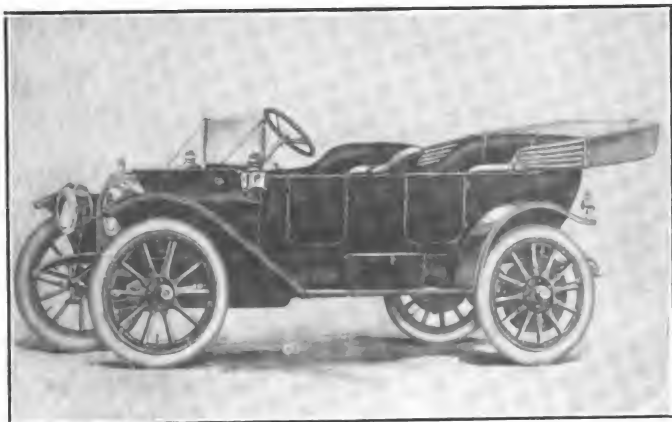
PACKARD MOTOR CAR CO.
Detroit, Mich.



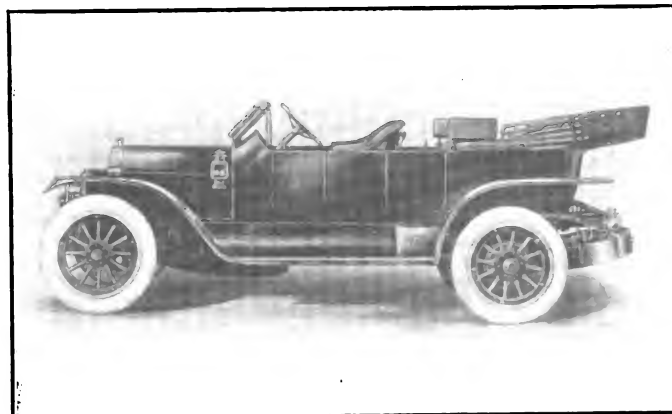
OHIO MOTOR CAR CO.
Cincinnati, Ohio



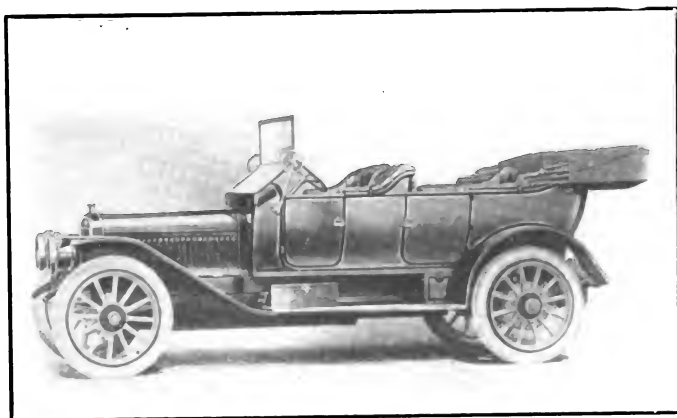
OHIO MOTOR CAR CO.
Cincinnati, Ohio



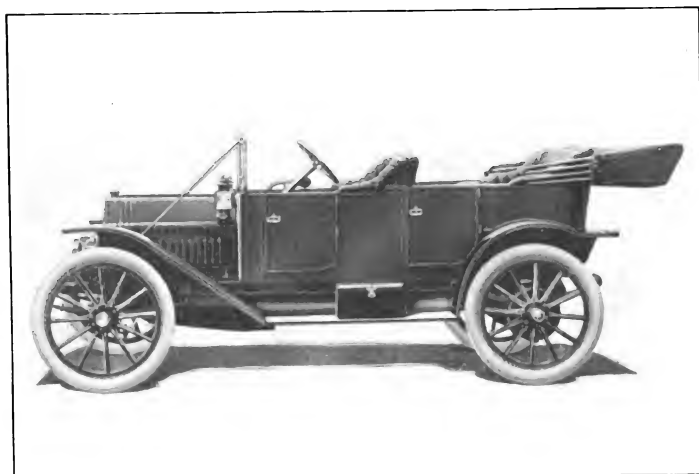
OHIO MOTOR CAR CO.
Cincinnati, Ohio



KNOX AUTOMOBILE CO.
Springfield, Mass.



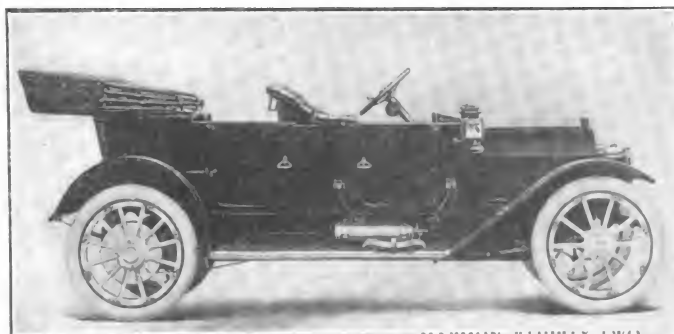
WINTON MOTOR CAR CO.
Cleveland, Ohio



MOLINE AUTOMOBILE CO.
East Moline, Ill.



LION MOTOR CAR CO.
Adrian, Mich.



NORDYKE & MARMON CO.
Indianapolis, Ind.



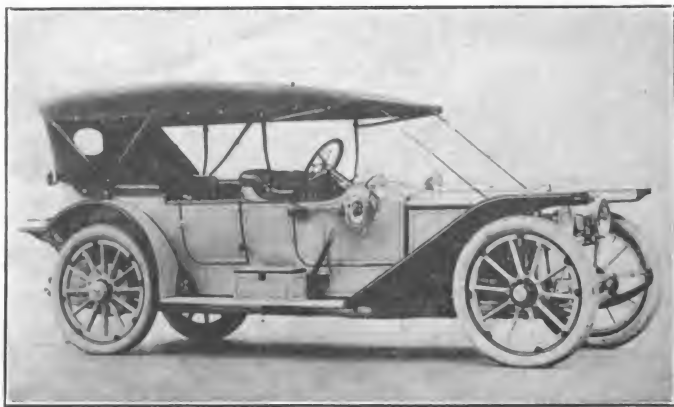
AMERICAN MOTORS CO.
Indianapolis, Ind.



AUBURN AUTOMOBILE CO.
Auburn, Ind.



GAYLORD MOTOR CAR CO.
Gaylord, Mich.



AMERICAN MOTORS CO.
Indianapolis, Ind.



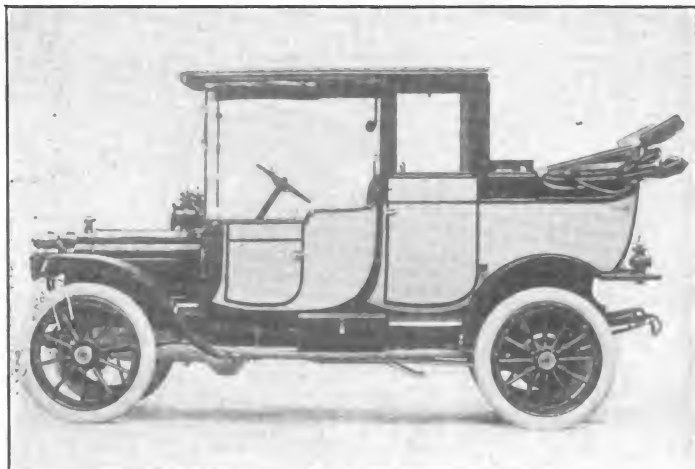
AUBURN AUTOMOBILE CO.
Auburn, Ind.



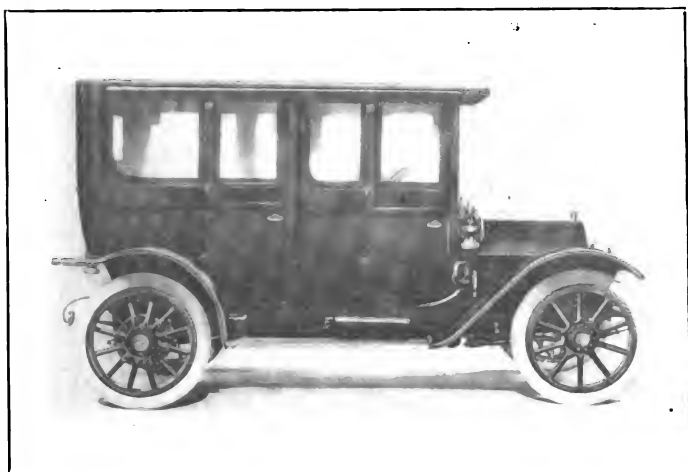
W. H. McINTYRE CO.
Auburn, Ind.



PACKARD MOTOR CAR CO.
Detroit, Mich.



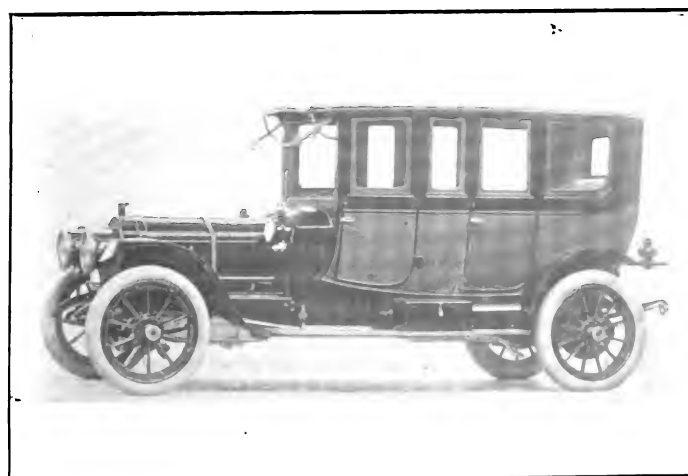
PACKARD MOTOR CAR CO.
Detroit, Mich.



CHALMERS MOTOR CO.
Detroit, Mich.



PACKARD MOTOR CAR CO.
Detroit, Mich.



PACKARD MOTOR CAR CO.
Detroit, Mich.



KNOX AUTOMOBILE CO.
Springfield, Mass.



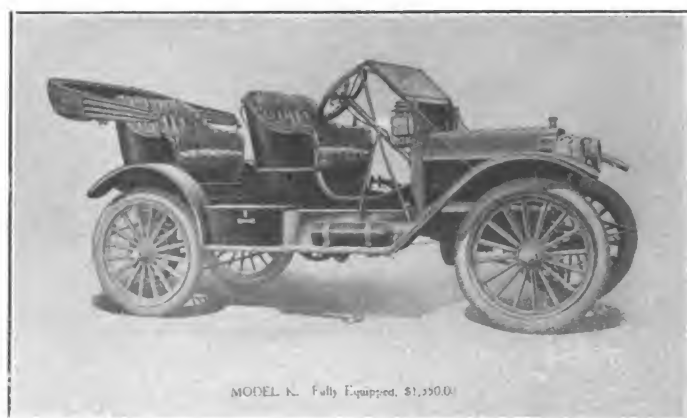
PACKARD MOTOR CAR CO.
Detroit, Mich.



REGAL MOTOR CAR CO.
Detroit, Mich.



GAYLORD MOTOR CAR CO.
Gaylord, Mich.



MODEL N. Fully Equipped, \$1,350.00

KEARNS MOTOR CAR CO.
Beavertown, Pa.



DURYEA AUTO CO.
Saginaw, Mich.



DURYEA AUTO CO.
Saginaw, Mich.

Electric Automobiles



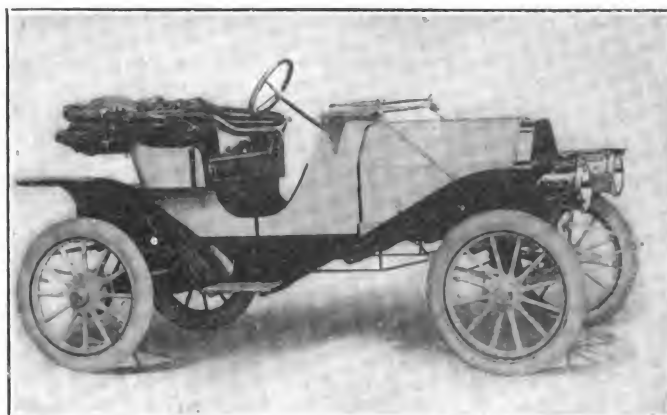
WAVERLY CO.
Indianapolis, Ind.



WAVERLY CO.
Indianapolis, Ind.



S. R. BAILEY & CO.
Amesbury, Mass.



WAVERLY CO.
Indianapolis, Ind.



WAVERLY CO.
Indianapolis, Ind.



WAVERLY CO.
Indianapolis, Ind.

COMMERCIAL TRUCKS

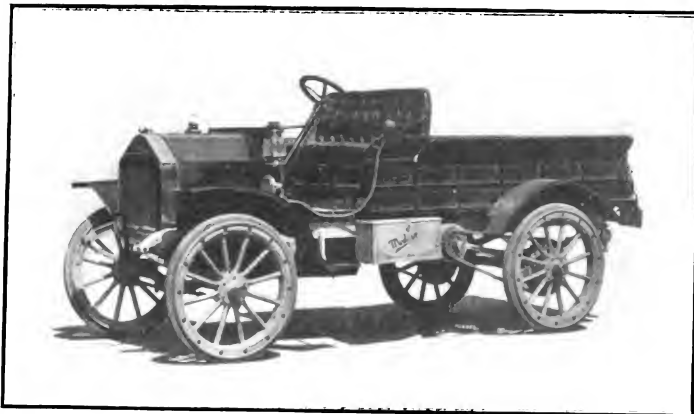
GASOLINE



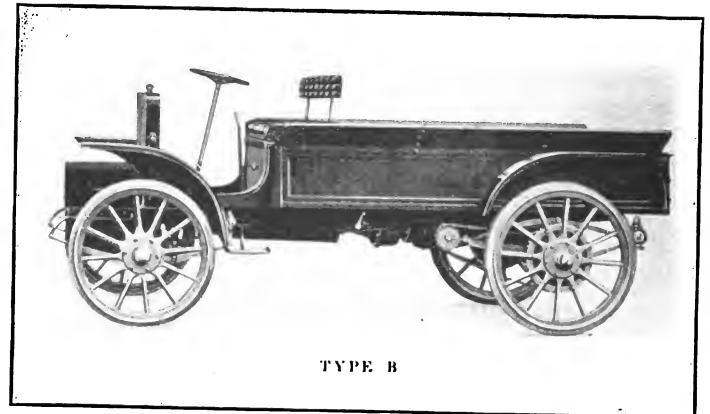
SPEEDWELL MOTOR CAR CO.
Dayton, Ohio



FINDLAY MOTOR CO.
Findlay, Ohio



BOWLING GREEN MOTOR CAR CO.
Bowling Green, Ohio



GENEVA WAGON CO.
Geneva, N. Y.



MAIS MOTOR TRUCK CO.
Indianapolis, Ind.



KEARNS MOTOR CAR CO.
Beavertown, Pa.



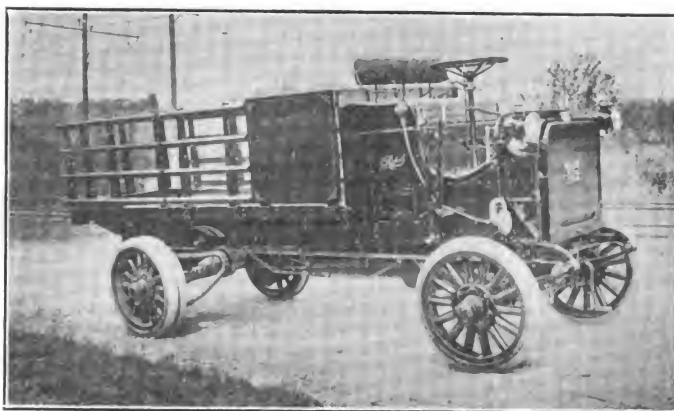
MAIS MOTOR TRUCK CO.
Indianapolis, Ind.



FINDLAY MOTOR CO.
Findlay, Ohio



KEARNS MOTOR CAR CO.
Beavertown, Pa.



RAPID MOTOR VEHICLE CO.
Pontiac, Mich.



ADAMS BROS. CO.
Findlay, Ohio



RAPID MOTOR VEHICLE CO.
Pontiac, Mich.



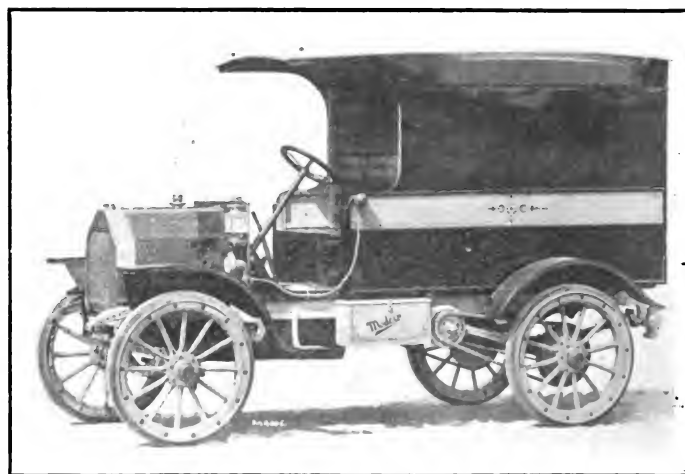
CASS MOTOR TRUCK CO.
Port Huron, Mich.



CASS MOTOR TRUCK CO.
Port Huron, Mich.



FINDLAY MOTOR CO.
Findlay, Ohio



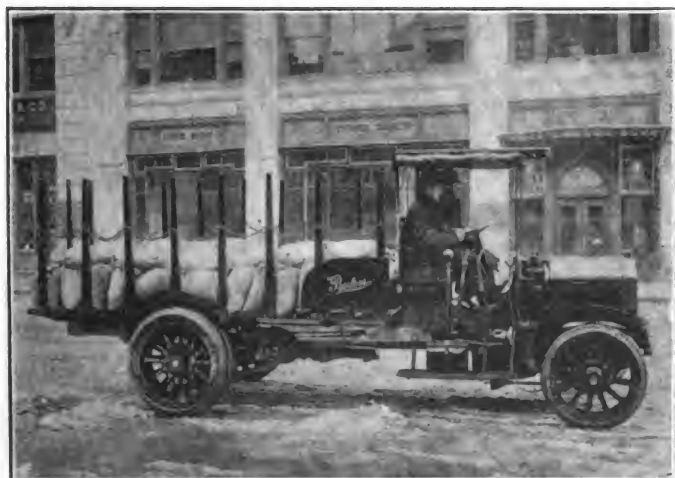
BOWLING GREEN MOTOR CAR CO.
Bowling Green, Ohio



CASS MOTOR TRUCK CO.
Port Huron, Mich.



FINDLAY MOTOR CO.
Findlay, Ohio



PEERLESS MOTOR CAR CO.
Cleveland, Ohio



RAPID MOTOR VEHICLE CO.
Pontiac, Mich.



GRABOWSKY POWER WAGON CO.
Detroit, Mich.



CASS MOTOR TRUCK CO.
Port Huron, Mich.



GRABOWSKY POWER WAGON CO.
Detroit, Mich.



COMMERCIAL TRUCK CO. OF AMERICA
Philadelphia, Pa.



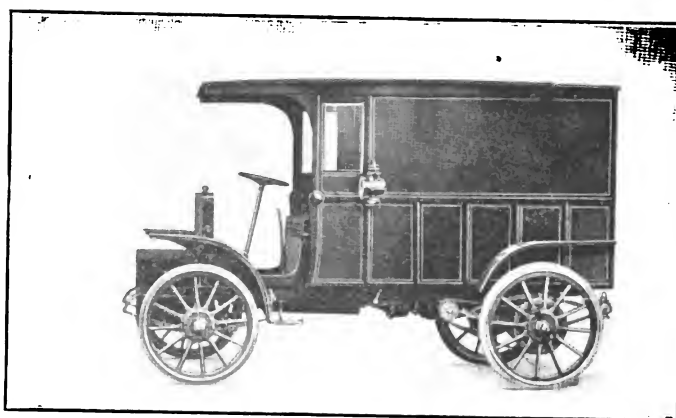
GRABOWSKY POWER WAGON CO.
Detroit, Mich.



GRABOWSKY POWER WAGON CO.
Detroit, Mich.



AVERY CO.
Peoria, Ill.



GENEVA WAGON CO.
Geneva, N. Y.



CASS MOTOR TRUCK CO.
Port Huron, Mich.



FINDLAY MOTOR CO.
Findlay, Ohio



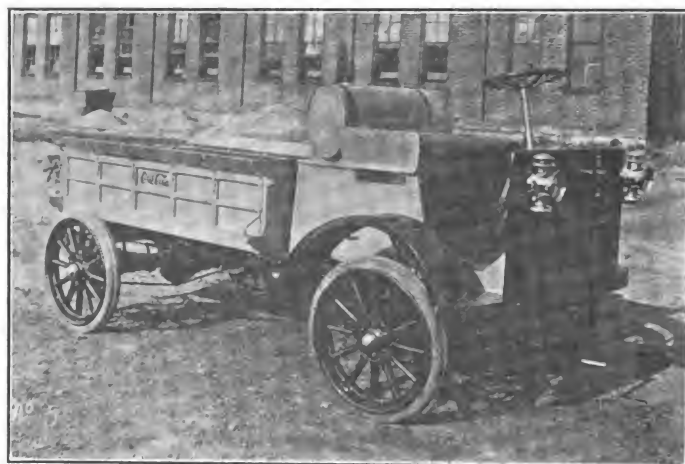
DURYEY AUTO CO.
Saginaw, Mich.



W. H. MCINTYRE CO.
Auburn, Ind.



FINDLAY MOTOR CO.
Findlay, Ohio



FINDLAY MOTOR CO.
Findlay, Ohio



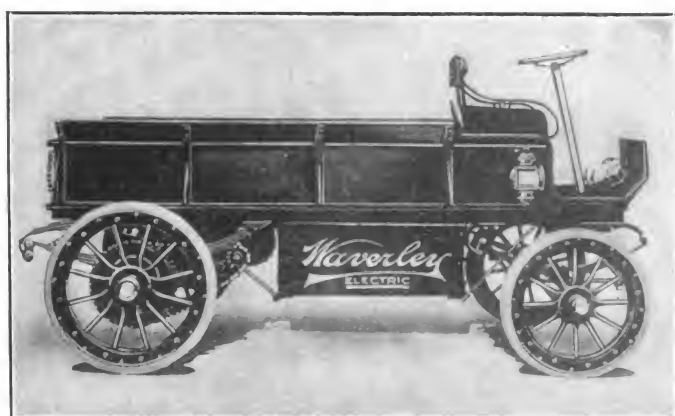
GRABOWSKY POWER WAGON CO.
Detroit, Mich.



GRABOWSKY POWER WAGON CO.
Detroit, Mich.

Commercial Trucks

ELECTRIC



WAVERLY CO.
Indianapolis, Ind.



WAVERLY CO.
Indianapolis, Ind.



WAVERLY CO.
Indianapolis, Ind.



WAVERLY CO.
Indianapolis, Ind.

ANNUAL REPORT OF TRUSTEES, TECHNICAL SCHOOL.

New York, September 1, 1911.

To the Board of Trustees of the Technical School, Charles J. Richter, Esq., chairman.

Gentlemen: I herewith present my report of the Technical School for the year which closed yesterday.

Day and Evening Classes.

The day and evening classes opened for the season on September 26th, 1910, in the school rooms in the Mechanics' Institute at 20 West 44th street, New York City.

There were nine pupils in the day class and forty-eight in the evening class. The pupils in the day class came from the following named places: Indiana, one pupil; Massachusetts, one; Michigan, one; New Jersey, two; New York City, three; Canada, one. Their ages varied from eighteen years to forty years, with an average age of twenty-three years. Six of these men were body makers, and there was one general woodworker, one blacksmith and one draftsman. The attendance for the season in the day class was 96 per cent.

Evening Class.

The pupils in this class claimed the Greater New York as their home, although some of them came here and obtained employment during the day in order to attend our school in the evening. Their ages varied from sixteen years to forty years, with an average of twenty-three years.

Twenty-five of these men were body makers, eight were general woodworkers; three were trimmers, four were blacksmiths, two were foremen, two were automobile mechanics, two were superintendents and three were office men. The attendance for the season in the evening class was 81 per cent.

The day and evening classes closed for the season on April 5, 1911. There were six graduates, three from the day class and three from the evening class. The names of the graduates are as follows: William Murray Gray, Edward John Williams, Louis Henri Neipp, Frank Wesley Pierce, Arvid Leonard Johnson, William John O'Donohue. The average age of the graduates was twenty-seven years.

Corresponding Department.

This department of our school, as is well known, is open for business during the entire year, and the following report is of the work done from September 1, 1910, to September 1, 1911:

Number of students enrolled	56
Number of drawings received	1210
Number of letters received	1076
Number of letters sent	1079
Number of examination paper filled out by students	168
Number of rating cards sent out by the instructor..	1378

This department has been especially active during these summer months notwithstanding the heat, and the fact that nearly every pupil in this department works during the day, and many of them work overtime more or less.

In General.

All departments of the school have done good work during the year, and, while no particular one has been especially prominent in this respect, the whole will average well with any year of our school. Since we have been in the Mechanics' Institute and the instruction in the day and evening departments is free, the evening students are allowed to come and study in the day time if they happen to have a day or so of idle time, and many of them avail themselves of this permission, greatly to their benefit.

Before closing this report I wish to thank our Board of Trustees most gratefully for their kindness to me during the year, as well as heretofore. Some mention should be made of the great courtesy and consideration shown to the writer by the gentlemen composing the management of the Mechanics Institute where our school has its home. Nothing could be finer.

On behalf of our school I wish to thank the excellent journals devoted to our trade for printing notices and otherwise helping the school.

Respectfully submitted,

ANDREW F. JOHNSON, Instructor-in-Chief.

FOURTH ANNUAL MEETING OF SALESMEN AT FACTORY.

Salemen of the Emerson-Brantingham Company and the Emerson Carriage Company entered upon their annual meeting in Rockford, Ill., August 14. The sessions were continued through four days. There were numerous social entertainments for relief from "shop talk." There was a four-course dinner at the Country Club, followed by a smoker. The salesmen elected by ballot the buyers and sellers for the sales demonstrations on the succeeding days.

The carriage company banquet was held Tuesday evening at the Nelson Hotel. The speakers and topics were: Mr. Brantingham, "Our Second Anniversary;" Mr. Lathrop, "Observations on the Firing Line;" Mr. White, "How Our Vehicle Business Should Be Helped by Our Implement Business;" Mr. Crawford, "How Building Our Own Vehicles Increased Our Sales in 1911;" O. B. Bannister, president National Wheel Manufacturers' Association, "Wheels, Their Uses and Abuses;" W. H. Son, president and general manager Sheldon Axle Company, Wilkes-Barre, Pa., "How Good Springs and Axles Help the Salesman."

On Wednesday evening there was a banquet in the dining room at the implement plant, Charles S. Brantingham, secretary-treasurer Emerson-Brantingham Company, acting as toastmaster. On Friday afternoon there was a steamer trip and a baseball game. Visitors remaining over Friday evening visited Harlem Park.

LIST OF GENERAL MOTORS HOLDINGS.

An interesting document recently filed at Lansing, Mich., gives what is believed to be the first authentic list of factories comprising the General Motors group. The list is as follows: Buick Motor Co., Cadillac Motor Co., Olds Motor Co., Elmore Manufacturing Co., Cartercar Co., Northway Motor and Manufacturing Co., Marquette Motor Co., Randolph Motor Car Co., Rapid Motor Vehicle Co., Reliance Motor Truck Co., Welch Co. of Detroit, Welch Motor Car Co., Champion Ignition Co., Jackson-Church-Wilcox Co., Michigan Auto Parts Co., Oak Park Power Co., McLaughlin Motor Car Co., Ltd., and the Weston-Mott Co.

MOLLER & SCHUMANN ESTABLISH NEW BRANCH ON THE COAST.

Moller & Schumann Co. have opened a branch at 1022-1024 Mission street, San Francisco, under the management of Mr. Geo. N. Davenport, where a full line of M&SCO varnishes will be kept for the convenience of customers. Mr. Davenport is thoroughly conversant with the needs of the carriage and auto trade, as he has had eighteen years' experience in that line, and is thoroughly capable to attend to the wants of this trade. He enjoys a wide acquaintance in the Coast States from Galveston, Texas, to Seattle, Wash.

IMPROVEMENTS AT STAYER PLANT.

Contracts have been let for two large brick buildings, 155x50, three stories, which will increase the manufacturing capacity of the Stayer Carriage Company, Chicago, Ill., to the extent of 5,000 jobs annually. This addition to the manufacturing facilities of the company and the assurance that the trade could be cared for to better advantage lent interest to the annual conference of traveling men recently held at the factory.

TOP NOTCH RECORD.

S. B. and E. L. Meadows, implement and vehicle dealers at Vidalia, Ga., have set a top notch record in the buggy business by placing an order for 300 buggies, which will require a train of 25 cars to deliver. It is the largest single order of buggies ever placed from that section of the south, but is justified in view of the bumper crops of cotton and corn in that section.

WEED REAPS HARVEST OF INJUNCTIONS.

Following the decision of the United States Circuit Court of Appeals for the Seventh District in favor of the Parsons patent, No. 723,299, which covers the Weed Chain Tire Grip, which decision was rendered in the suit against the Excelsior Supply Co. and the Pitts Anti-Skid Co. of Chicago, the Weed Chain Tire Grip Co. has proceeded all along the line. Injunction orders have been obtained against The Garage Equipment Co., making the Superior grip; the Milwaukee Auto Specialty Co., makers of the Radium grip; the H. Channon Co., makers of parts for grips; Chicago Chain & Mfg. Co., makers of the Chicago grip; Leo Rabin, maker of the Reliable grip; U. T. Hungerford Brass Co. and Pearsall-Traver Co., manufacturers of the Reliance grip; William Wooster, selling the Victor grip; J. Stewart Smith, selling the Morgan and Whittaker grips; The 35% Automobile Supply Co. and A. B. Norwalk, selling the Cleveland, Wearwell and other grips. Three other manufacturers of grips have consented to injunction orders which are before the court for signature. They are the Enterprise Chain Co., makers of the Morgan grip; Cleveland Chain & Mfg. Co., makers of the Wearwell and Economy grips; Newall Chain, Forge & Iron Co., manufacturers of the Presto and Ever-Ready grips.

THE GREGG-W. H. ROGERS CO.

The Gregg Carriage Co. 1934 Arch street, Philadelphia, has purchased the property 40x150 feet, adjoining its building, the assessed valuation of which is \$25,000. The site will be used for a large addition to the present building of the Gregg Carriage Co., which has just formed a consolidation with the William D. Rogers' Son Co., under the title of The Gregg-Wm. D. Rogers Co. The new company begins operations with a capital of \$100,000, and will supply the community with either horse-drawn or motor vehicles.

The Gregg Carriage Co. was organized in 1855 and the house of W. D. Rogers in 1846.

The plant of the Gregg concern will remain practically undisturbed, and the new company will continue to display horse vehicles as they are showing at present. When the new building is ready for occupancy, about January 1, 1912, the entire motor departments of the two present concerns will be united in the new building, while the united horse vehicle branches will occupy the older portion.

The officers of the new concern are Henry F. Keachline, president; Eugene C. Everheart, vice-president and general manager; Frank W. Shriver, treasurer, and James C. Robb, secretary.

HOW DO THEY DO IT?

The trade wonders how the Cooper Carriage Wood Work Co., of St. Louis, cuts up "over 800,000 feet of choice stock daily." Well they don't do, although we said they did. Put it down to enthusiasm or the hot weather. Yearly would come nearer the mark, but in any event, it is a good way of describing the trade and energies of this very important enterprise. The concern does get out 750 sets of gear woods daily, but that will not be an accurate statement soon, as it is to be raised to one thousand sets. The large amount of raw stock on hand that such an outturn indicates makes the conclusion plain that the selection will always be just right for the use intended.

MODRIS WOODHULL A STATE OFFICIAL.

Mr. Morris Woodhull was recently appointed by Gov. Harnion a member of the State Liability Board of Awards to serve four years. The duties of this appointment will require his presence in Columbus at frequent intervals.

WHO MAKES RAMBLER PADS?

Lutz & Co., Washington, D. C., would like the address of the firm that makes the "Rambler" Rubber Hoof Pads.

COMING SHOWS AND MEETINGS.

- September 25-30—Atlantic City, N. J., Convention and Exhibition of the Carriage Builders' National Association.
- January 1-5, 1912—New York City, Grand Central Palace, Annual Show, Automobile Manufacturers' Association of America.
- January 6-13—New York City, Madison Square Garden, Twelfth Annual Show, Pleasure Car Division, Automobile Board of Trade.
- January 10-17—New York City, Madison Square Garden, Annual Show, Motor and Accessories Manufacturers.
- January 10-17—New York City, Grand Central Palace, Twelfth Annual Show, National Association of Automobile Manufacturers.
- January 15-20—New York City, Madison Square Garden Twelfth Annual Show, Commercial Division, Automobile Board of Trade.
- January 18-20—New York City, Annual Meeting of the Society of Automobile Engineers.
- January 27- February 10—Chicago Coliseum, Eleventh Annual Automobile Show under the auspices of the National Association of Automobile Engineers. Pleasure cars, first week; Commercial vehicles, second week; accessories, both weeks.
- March 2-9—Boston, Mass., Tenth Annual Show, Boston Automobile Dealers' Association, Inc.

MILES GETS CONTROL OF PALACE.

In addition to securing the new Grand Central Palace in New York for the "open" show which will be held in January by the National Association of Automobile Manufacturers, Samuel A. Miles, general manager of that organization, had gone further and associated with several other men who have been identified with exhibitions of various sorts, has formed a company which has leased the Palace and which, therefore, will be in position to control all shows and other displays which may be held in that building.

This new company is styled the International Exposition Co. and Miles is its president. The other officers are as follows: Vice-president, Richard G. Hollaman; secretary and treasurer; James C. Young; managing director, Capt. J. A. H. Dressel. Directors—Edward V. P. Ritter, Charles E. Spratt, Samuel A. Miles, James C. Young, Richard G. Hollaman and J. A. H. Dressel.

CINCINNATI WEDDINGS.

Her Name's Denis.

William T. Denis and Miss Lillian Ketterlinus are married. The bride was formerly employed as a stenographer at the Cincinnati and Hammond Spring Co., where the groom is the general manager. We wish them much joy.

A Buob for Her's.

An affection that began when they were playmates culminated in the marriage of Louis J. Buob, Jr., and Elizabeth Boehm. The groom is the son of Louis Buob, of the firm of Buob & Scheu, carriage top manufacturers, and is employed in the office as bookkeeper. They have our heartiest congratulations.

WILL ERECT CANADIAN PLANT.

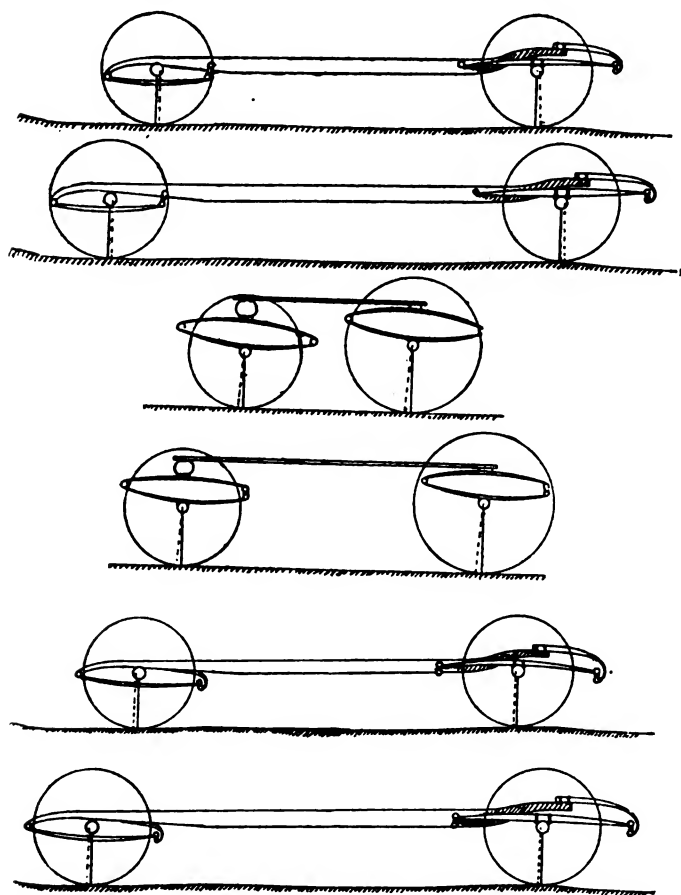
The National Spring and Wire Co., of Albion, Mich., is about to construct at Windsor, Ontario, a reinforced concrete building 90x140 feet, for making coiled springs for furniture, and other lines of wire goods. The town exempts the company from taxes and furnishes free water for ten years.

GARNET FOR BELTS?

The Altamaha Woodworking Co., Darien, Ga., would like the names of some manufacturers of garnet for sand belts.

SPRING SUSPENSION.

The provision of perfectly level roads, if such a thing were possible, would not remove all the little difficulties out of the way of the designer of motor chassis. It may serve a useful purpose to examine some of the conditions of the roads, and the relation they bear to the manner in which the motor carriage springs are attached to the chassis. It may be that some day a motor carriage tire can be invented which will have all the advantages of the pneumatic tube, be more resilient, but not so resilient as to break up in use or act as a drag on the speed, which will absorb all of the minor shocks and inequalities of the road, and meet the greater ones more than half way without any bouncing, and wear for a sufficient mileage to satisfy both maker and user, and be procurable at a small price. But this tire is not yet available, and as the present work of absorbing the road shock is divided



between the resilient pneumatic tire in its rubber case and the laminated springs, the most must be made of these aids to comfortable travel.

As the perfectly level road cannot be provided, nor all the road inequalities absorbed by the resilient tire, the laminated spring may be considered in its manner of meeting and dealing with the road irregularities. As all sorts of contours may be met with the accompanying sketch of a roadway greatly worn has been utilized on which to place the illustration. The rear part has a slight rise of $1\frac{1}{2}$ in., and the front a depression of about 2 in. in depth, the rear end of the chassis frame being raised about 3 in. from the level. It is assumed that the frame is loaded level, the springs being deflected about 3 in. The two upper sketches are a 15 h.p. standard type, with a wheelbase of 9 ft. 8 in. and wheels 34 in. diameter, and the lower one a 38 h.p. standard type, with a wheelbase of 11 ft. 6 in. and wheels 36 in. diameter. In these two the front springs are shown with both ends parallel with the frame. In the rear springs, the deflection is divided between the upper half spring and the lower one.

The two center sketches have been drawn from two carriage drawings of the period of 1840-55. At this period the careful mechanical construction of road vehicles was being studied by

the French authorities interested, and a work of great technical value was written, under careful editorship, dealing with the various mechanical parts, and this particular carriage was used as an illustration.

This practice of giving a "pitch" or tilt to the front of the springs of a road carriage has, therefore, something more behind it than mere "rule of thumb."

There is a slight difference in the manner of construction between the two springs, but the angle at which the lower half is set to the horizontal is the same in both instances in the originals.

The two lower sketches show chassis of the same dimensions as the upper ones, says *The Motor*, but with the springs set out in an amended position. The angle of the springs is normally that of the horse-drawn carriage, but as both the front and rear springs have half-bow-ended springs connecting them with the frame, a part of the total deflection, due to the (assumed) load on the chassis, is taken up by these and the angle, to the horizontal, of the lower spring is less accordingly. The rear springs are supposed to be under excess load at the moment of passing over the "hump" in the road.

The vertical line under the center of each wheel is the line of support of the load on the springs, the dotted lines, drawn on the chassis away from their correct position to show them clearly, are lines at a right angle to a line drawn through the center of the spring eyes. The lines on the two middle sketches are drawn from the center of the wheel, and show the angle under normal conditions on a level piece of ground.

A comparison of the chassis sketches will show how the pneumatic tire, supposed to be on the wheels, being a continuous spring or resilient body, will always take the inequalities usually met with on the road, at the correct angle, but the laminated spring, being a machine fixed in a certain position cannot accommodate itself to the various angles at which inequalities may be encountered. It will be equally clear that if the right angle of the spring falls behind the vertical support it must be some distance behind the angle at which the pneumatic tire is taking the inequality and the spring is not in a position to respond to the call upon it, and can only offer a feeble resistance to the shock, passing it on through the rigid connection to the frame. In the amended position, as shown in the two lower sketches, the laminated spring is in a position to respond and to second the effort of the pneumatic tire to absorb the shock, and much of the shock on the spring is further reduced by having to pass to the frame, through the bow-ended connecting spring.

The correctly-suspended motor carriage should ride steadily on the springs.

HOW TO PRESERVE CHAMOIS SKINS.

After chamois skins used for cleaning and polishing have been in service for some time they become dirty and grit which will mar paint work will adhere to them. They may be returned almost to their original condition, however, though the operation necessarily is lengthy. They first should be brushed with a stiff brush to remove all adhering grit, after which they should be covered with soft soap and allowed to remain several hours in a bath of hot water to which a little common washing soda has been added. Next, they should be rubbed until perfectly soft and clean, when they should be rinsed in a weak solution of soda and soft soap in hot water and hung up to dry. Chamois skins should not be rinsed in pure water as it has a tendency to harden them.

BECOMES ASSISTANT MANAGER.

An announcement has been made by W. J. Mead, vice-president and general manager of the Olds Motor Works, Lansing, Mich., to the effect that Les W. Place has been appointed assistant to the general manager. Mr. Place is well known among automobile men, his activities with the Olds Motor Works dating from 1909.

STORED LEATHER.

Stored leather, in all leather warehouses, is often a source of great anxiety and trouble, as it is liable to deterioration by several causes, and it often occurs that the appearance of the leather is impaired by keeping. Several prejudicial influences—dust, conditions of humidity, etc.,—may be encountered, and the leather become hard and brittle, the fibre tender, and the durability and firmness of the leather reduced.

The greatest source of trouble is mould, which is liable to make its appearance on heavy and light leather alike, and which is sometimes difficult to completely remove. Attempts to wash or brush off may result in streaking the mould over the leather, and a worse appearance.

Suitable treatment for sole leather, upon which mould has developed, is to thoroughly dry in a warm, well-ventilated room, and then brush tanbark dust over both sides of the leather, when the mould will be removed along with the dust. This is followed by the application of flour, French chalk, or something similar, to renew the appearance of the leather.

Mould may be removed from black upper leather by simply washing, after which the leather is lightly oiled, dried out, and if necessary, refinished. Brown leather must be treated differently. In this case the mould is removed by rubbing with a piece of cloth. The flesh side is cleaned, smeared with soap or season, and glazed.

All leather, if stored in a damp place, is liable after a short time to a reappearance of the mould.

Another source of trouble in light leathers being stored is "spueing," or the appearance of an exudation of a greasy or resinous nature. Resinous fats can best be removed by the use of solvents in which they are soluble, such as benzine, turpentine, petroleum, etc. Frequently, however, in dyed leathers, these solvents remove some of the color, and redyeing is sometimes necessary.

Leather which has become hard during storage may be softened and have its nature revived by "greasing," care being taken to obtain an even application of the oil or fat.

Black leather sometimes loses its pure black color and becomes bronzed or has a reddish appearance. Reblacking is the remedy for this trouble, and better results are obtained by first treating the leather with tan liquor or logwood liquor and then applying the black.

If the leather has lost its gloss it is advisable to wash off any remaining glaze (with warm water, if glue or blood has been used, and with hot spirits if shellac was employed), and then to reglaze and finish.

Dirt and dust can generally be removed by rubbing with a cloth, and the application of a little French chalk often helps to give a clean appearance.

A NEW GEAR-WOOD FACTORY.

Beginning business at a period when times were hazardous, October 17, 1907, the Buckeye Handle, Gear and Bending Co., Alliance, O., not only weathered the storm, but is now flying the by-ways of success, officered as follows: S. A. Wells, president; C. Strom, vice-president; W. H. Bidwell, secretary and treasurer. The combination which is one hard to beat, is experienced in the manufacture of gear-woods, bending and handle production to a degree that instills confidence in the buyer.

Mr. Wells was foreman of a gear-wood concern formerly located at Struthers, Ohio, for 18 years. Mr. Bidwell had charge of the shipping department of the same company for 14 years, and Mr. Strom is a spoke and handle manufacturer of 35 years' experience.

This concern will make a specialty this season of ironed reaches for buggies, surreys and phaetons, with the following specifications: The ironed gear sets consist of bent reaches mortised into the head-block and ironed throughout on the bottom

with steel plates, fitted with Brewster fifth wheel and perch heels on. The following parts accompany the ironed reaches, which make it all ready to put together; one pair axle beds, one pair spring bars, one kingbolt, one yoke and double brace, one pair of steel reach stays. The iron on this set is all wrought except the perch heels and head-block plate, which is the best of malleable. This set is known as Reliable No. 40. Write this company if you want good service and fine quality. The company manufactures gear-woods, singletrees, doubletrees, neck yokes, hickory and oak spokes, wood hubs, Sarven-Warner and shell-band patterns.

FIFTEEN MILLION IN TEN YEARS.

This refers to cushion trimming springs, and is a pretty fine record that is made by the Wm. A. Murray Spring Co., of Cincinnati. The outstanding merit of these goods is that they endure. This means fine art in construction and tempering. Their patterns fit all requirements, and you can "go as far as you like" in quantity ordering, and get what you need with promptitude. The company's Canadian trade will be better served than usual after October 1, when the new steel and concrete factory at Windsor will be occupied, greatly increasing production.

PACKARD PRODUCES A LIGHTER TRUCK.

Supplementing the representation it already has in the commercial field with its three-ton truck, the Packard Motor Car Co., of Detroit, Mich., has brought out a lighter and faster model for a normal load of 3,000 pounds. The motor is 26.4 horsepower, A.L.A.M. rating, and the chassis is furnished in two lengths of wheel base, 10 feet and 12 feet, respectively.

WHO MAKES THEM?

R. K. Carter & Co., 66 Reade St., New York, want to know the address and firm name of the concern making Person's Peerless Saddles; also The Druid Oak Belting Co., Baltimore, Md., wants to know who has a second-hand leather stitching machine for sale. They want a machine that will make a lock stitch for heavy work.

FINE LIGHT DELIVERY CARS.

In another place is an illustration of a car for light business work made by The Bowling Green (Ohio) Motor Car Co. There are a number of features well worth illustrating and describing so we have deferred a full description to our October issue when we can illustrate details in a way worthy the construction.

SALE OF ABBOTT-DOWNING CO. PLANT.

S. C. Eastman, of Concord, N. H., purchased on July 31 the plant of the Abbott-Downing Co., of that city, for \$56,853. The Abbott-Downing Co. was famous for many years as the makers of the Concord coaches. Mr. Eastman's plans have not yet been announced.

NEWS ITEM.

The Swinehart Tire & Rubber Company, Akron, O., have just published their first carriage tire catalogue. It is brim full of useful information relative to both solid and cushion carriage tires and the application of them. A copy may be had for the asking.

ROUGH STOCK WANTED.

The Lucas E. Moore Stave Co., 11 Broadway, New York City, want the addresses of manufacturers of rough ash and hickory wagon and carriage material. All straight stock.

VARNISH DEVILTRIES.

This is the seasonal time for varnish "deviltries." The heat and the humidity make light of the job. They are clever advance agents of varnish deterioration. Everybody agrees that the mischief is done because it takes so long for the usual varnishes to dry out. The harmful weather conditions have ample time to do all kinds of tricks that spoil temper and cause expense.

It is a very striking thing that Valentine & Company has done in its Celox Four-day System of Varnishing. If this well thought-out system had come from some scientific laboratory not frankly commercial, the paint and varnish writers would have made it their theme because of its originality—and because new themes are very scarce in the line. The booklets the company is offering freely are good varnish literature, and the company is making a very interesting offer that it would pay to read in the announcement.

BRANCHING OUT.

C. Cowles & Company, of New Haven, Conn., have recently bought the business, good will and stock on hand of the late B. D. Druen, of New Haven, who has been manufacturing a line of forgings for automobiles, coaches and hearses, including pole crabs, whiffletree couplings, coach bed clips, pole holders, gridiron steps, slat irons, trace bolts etc. Within two years this firm has bought out the Newark Coach Lamp Company, of Newark, N. J., and part of the G. W. J. Murphy Company, of Merrimac, Mass., and with the latest acquisition will be in position to furnish almost all trimmings, mountings, light forgings, etc., for automobiles, coaches, hearses and four-in-hand vehicles.

SOLID TIRE STANDARDS TO RULE.

The Society of Automobile Engineers has now come in public espousal of the standard tire dimensions for demountable and non-demountable solid motor tires, and is receiving encouragement to entertain the view that they will be generally accepted by the trade. The specifications standardize the use of a permanent steel band over the wood wheel and stipulate the dimensions of the band and felloe for a given nominal diameter sectional size of tire, as well as tolerance or allowable variation from exact size. Standard flange dimensions and standard bolt sizes and bolting spacings are now being considered and will be fixed as soon as possible.

CORTLAND MOTOR WAGON COMPANY MOVES.

The Cortland Motor Wagon Company, Cortland, N. Y., has moved to Pittsfield, Mass. The company employs one hundred hands and manufactures light delivery trucks. Already a train-load of stock and machinery has been shipped to Pittsfield, and the machinery will be installed in buildings belonging to the electric plant.

SECHLER EMPLOYEES ON ANNUAL PICNIC.

About three hundred employes of the D. M. Sechler Carriage and Implement Company, Moline, Ill., gathered at Campbell's Island Saturday, August 26, for the third annual picnic. Most of the men and their families ate picnic dinners at the island and a large crowd gathered for the baseball game and the races in the afternoon.

TUFTING BY MACHINERY.

An interesting exhibit that will be seen in operation at the Carriage Builders' National Convention in Atlantic City will be the Buser-Poston tufting machine, made by the Buser-Poston Tufting Machine Co., at Chillicothe, Ohio. This trimming machine always attracts interested attention because its work is so complete, rapid, thorough, and economical.

BICKNELL'S COMBINATION WOODWORKER.

Bicknell's jointer, saw and combination machine is designed for general use in wagon and carriage shops. This handy machine is made with different combinations which enables the operator to do jointing, sawing, rounding, grooving, dado work, boring, etc. All of this can be done on the one arbor.

The arbor, jointer head, pulley and inside collar are made in one piece from special spindle steel; this runs in high speed babbit bearings.

Slotted heads, special cutters and saws are used on the extended



arbor, and changes are easily and quickly made.

The most important features of his combination machine are simplicity, durability and the variety of work that can be done on one arbor.

This machine is manufactured by the Bicknell Manufacturing Co., of Janesville, Wis., who will be pleased to mail its catalogue of wagon and carriage makers' machinery to all interested parties.

T. W. WILBY A ROAD COMMISSIONER.

President Taft recently appointed Thos. W. Wilby, of New York, member of the Touring Club of America, as good roads commissioner, whose duty it will be to pick out and accurately log a route from New York to San Francisco and return, which shall not only include seeing all of the best of the wonder spots of our country, but shall be safe and possible of travel without hardship at practically all times of the year.

HUPP'S RETIREMENT ADVANCES HASTINGS.

Charles D. Hastings has been appointed general manager of the Hupp Motor Car Co., of Detroit, Mich., to succeed R. C. Hupp, who has sold his holding to a syndicate of the stockholders, and has resigned to devote his entire attention to his other interests. These latter include the Hupp Corporation, of Detroit, which makes the Hupp-Yeats electric cars, and which is to enter the gasoline field.

THE STUDEBAKER CLUB.

The Studebaker Club, an organization composed of the employes of the Studebaker Corporation at South Bend, Ind., held its fourth annual picnic on Saturday, August 19th. About four hundred employes of the office and factory took advantage of this excursion to visit Lake Maxinkuckee, a beauty spot about forty miles south of South Bend, as well as the Culver Military Academy.

RIGHT AT THE FRONT.

The Colonial Carriage Company, of Circleville, Ohio, will have a good display at the Tri-State convention and exhibit of the dealers in Cincinnati. The storm buggy, phaeton, Kentucky special buggies, and an auto-seat buggy will be good examples of the sterling character of the work the factory produces.

WILL MAKE EVANS MOTORS AND CARS.

The Automobile Mfg. & Engineering Co., of Detroit, Mich., has increased its capitalization to \$50,000. The following officers have been elected: S. E. Lockwood, president; J. P. Gallagher, vice-president; R. H. Evans, secretary, and T. F. Ferguson, director. Its products for 1912 will be the Evans motor.

Trade News From Near and Far

BUSINESS CHANGES.

J. Smith has purchased the stock of vehicles, etc., of N. R. Davis, in Barry, Ill.

Ira Maxen has purchased the stock of vehicles, etc., of J. E. Jones, in LeRoy, Kas.

Diebolt & Gray are engaging in the wagon and carriage business in Port Huron, Mich.

A. H. Zimmermann has purchased the stock of buggies, etc., of J. J. Hall, in Savannah, Mo.

F. J. Rubertus has purchased the stock of vehicles, etc., of A. McKenna, in Wagner, S. D.

S. S. Bulen has purchased the stock of vehicles, etc., of M. A. Dahma, in Walnut Grove, Mo.

W. H. Hargleroad has purchased the stock of buggies, etc., of W. L. Young, in Holstein, Neb.

C. E. Hansen has purchased the stock of buggies, etc., of Jackson & Albin, in Osceola, Neb.

J. C. Gretchman has purchased the stock of vehicles, etc., of H. M. Buckholts, in Tyndell, S. D.

W. M. Gorsuch has purchased the stock of vehicles, etc., in Vesta, Neb., of Gooseman & Son.

Pomeroy & Son have succeeded Wellington Pomeroy in the vehicle business in Standish, Mich.

D. J. Starkey has disposed of his stock of vehicles, etc., in Wolf Lake, Mich., to Max Goodman.

Dale Lytton, of Stillwater, Okla., has purchased the vehicle business of W. D. Wright, in Coyle, Okla.

T. S. Wilson has purchased the vehicle and implement business of A. F. Wheelock, in St. Charles, Minn.

Frank Kamoski has purchased the stock of vehicles, etc., of A. B. Heatherington & Son, in Manchester, Ia.

C. C. Messenger has disposed of his stock of vehicles and hardware in Butternut, Mich., to L. E. Walker.

J. A. Brown, of Appleton, Minn., has purchased the stock of vehicles, etc., of Ray Bros., in Nora Springs, Ia.

Cummins Bros. have purchased the stock of vehicles and hardware of Frank Miller & Co., in Prescott, Kas.

The Phippen Implement-Vehicle Co. has succeeded to the business of Jos. H. Phippen & Son., in Carey, Idaho.

Fundis & Fundis have purchased the stock of vehicles and implements of Johnston Bros., in Frankfort, Kas.

Henry Kuennig has purchased the interest of L. S. Fallers in the firm of Fallers, Seymour & Joyce, in Syracuse, Neb.

Thompson & Powell have disposed of their vehicle and hardware business in Marked Tree, Ark., to John Krier & Co.

Charles E. Gallagher, of Omaha, Neb., has purchased the implement, vehicle and wagon stock of Mr. Y. Greeley at Cole-ridge, Neb.

Joseph Wright, Atlanta, Ill., has sold his wagon shop to Phineas Romans, of McLean, who will run it. Mr. Wright will retire from business after a lengthy career.

The business of the C. G. Cochran Company, Plainville, Kan., has been sold to Ellis & Schwald, of Goldcamp, Mo., who will carry a full line of implements, vehicles, etc.

E. C. Newman, who has been making his home for the past few years at Waitsburg, Wash., has bought the Conaway implement and buggy business at Kirksville, Mo.

R. B. Blake has purchased a half interest in the Northwest Alabama Buggy & Wagon Company, Anniston, Ala. The business of the company will be considerably extended.

Wolkamont & Wilson, at Stockville, Neb., have sold their hardware business and will continue the implement and vehicle business which will now receive their personal attention.

Sim Brown's carriage shop, the oldest carriage manufactur-

ing establishment in Sacramento, Cal., has closed its doors, and Sim Brown, the owner, will retire from business. The shop was established more than fifty years ago by Daniel Brown, father of Sim Brown.

NEW FIRMS AND INCORPORATIONS.

Fife & Miller, Inc., Dalas, Tex., will handle vehicles exclusively.

L. Fox has opened a new stock of carriages, etc., in Duluth, Minn.

C. L. Tebow has engaged in the vehicle and hardware business in Randall, Kas.

E. A. Snapp will put in a full line of implements, also a line of buggies, at Oakland, Ia.

J. L. Howard has opened a new stock of vehicles and implements in Clayton, Kas.

A new wagon and machine shop will be opened in New Decatur, Ala., by McNeese & Son.

Edmund Johnson has opened a new stock of vehicles and hardware in Grand Island, Neb.

Huss Bros. & Morgan are now engaged in the vehicle and implement business in Mildred, Mont.

The Gower Wagon Co., has been incorporated in Gainesville, Ga., with a capital stock of \$10,000.

The Union Buggy Mfg. Co. has been incorporated in Florence, Ala., with a capital stock of \$3,000.

The Auto & Carriage Supply Co. has been incorporated in Dallas, Tex., with a capital stock of \$3,000.

The Gibbs Implement & Vehicle Co. has been incorporated in Shreveport, La., with a capital stock of \$3,000.

C. L. Barrett, formerly in business at Cairo, Neb., has entered into the implement and vehicle business at Dunning, Neb.

The Bearden Buggy Co., capital \$50,000, has been incorporated by W. E. Bearden and T. M. Robinson at Nashville, Tenn.

The Hall Buggy Co. has been incorporated at Chattanooga, Tenn., by Chas. Hall, J. M. Card and C. E. Hall, capital \$10,000.

H. J. Giese, of Council Bluffs, Ia., and others are figuring on opening a wholesale implement and vehicle business in Norfolk, Neb.

New Melbourne Buggy Co., Melbourne, Ky., has been incorporated, capital \$20,000, by M. J. McNamara, Felix Greis and J. Greis.

J. A. Heinrichs has opened a store at Kimball, S. D., with a new stock of implements, vehicles, electrical and dairy supplies, of all kinds.

The Twentieth Century Storm Buggy Co., has been incorporated at St. Henry, O., with a capital stock of \$20,000 by Henry Wimmers and others.

Southern Wagon Stock Co., Lufkin, Tex., has been incorporated with a capital of \$50,000. Incorporators N. D. Wright, L. P. Altmar, John W. Wood.

The Union Buggy Manufacturing Company of Florence, Ala., capital, \$3,000, has been incorporated by J. F. Jackson, W. F. Reynolds and C. C. Morreson.

Locker-Bettner Company, New Castle, Ind., capital \$10,000, has been incorporated by H. H. Locker and C. F. Bettner, to deal in implements, vehicles, etc.

The Mayo Manufacturing Company, capital \$6,000, to manufacture wagons and vehicles, has been incorporated by Franklin Mayo and W. N. Jacobson, at Chicago, Ill.

At Richmond, Ind., the Wayne Works, manufacturers of vehicles, has been incorporated with a capital of \$150,000 by E. B. Clemens, Harry Land and Howard Campbell.

The Sheboygan (Mich.) Coaster and Wagon Co., capital, \$40,-

000 has been incorporated. The Thomas Coaster Company's plant burned out and the new company is a consolidation of the Coaster company's business and the wagon works of Buettel Bros. A four-story brick addition to the Buettel Bros.' works is being rushed for completion by October 1.

NEW AUTOMOBILE CONCERNS.

The American Machine and Tool Works, Seattle, Wash., has obtained a plant at Interbay and will shortly begin the manufacture of automobiles.

Oklahoma Motor Wagon Company, Muskogee, Okla., capital, \$10,000; directors C. T. Chenevort, Chris M. Bradley and F. E. Fancher, all of Muskogee.

With R. J. Corbitt as president, a stock company has been organized at Henderson, N. C., and will at once build an automobile factory in that city. Capital \$250,000.

Automatic Fender Co., New York City, to manufacture fenders for autos, etc., capital \$1,000,000, has been incorporated by W. E. McGuirk, 735 Seventh avenue, and S. S. Myers.

The Norwalk Motor Car Co., Martinsburg, West Va., has been incorporated with a capital of \$300,000 by F. A. Minor, S. P. Hopkins, H. L. Alexander, T. W. Martin, G. W. McKown and L. H. Mace.

IMPROVEMENTS AND EXTENSIONS.

Coufal & Novak, of Dwight, Neb., are to erect a new vehicle repository.

The Staver Carriage Co., Chicago, is erecting a one-story concrete paint shop.

The Baltimore Buggy Top Co., of Baltimore, Md., will erect an additional story to its plant.

The Brown Wagon Co., of St. Louis, Mo., has increased its capital stock from \$50,000 to \$150,000.

The Martin Wagon Co., of Lufkin, Texas., has increased its capital stock from \$8,000 to \$28,000.

Samuel Kaufman, the vehicle dealer of Lake Charles La., is erecting a building of his own directly across the street from his present location.

The Gregg Carriage Co., Philadelphia, Pa., is putting up a new building at 1930 Arch street. It will be of concrete and brick, four stories, 46x140, and will cost \$40,000.

The business of the Northeast Alabama Buggy & Wagon Company, Anniston, Ala., has been greatly enlarged as a result of the purchase of a half interest in the concern by R. B. Blake.

BUSINESS TROUBLES.

The Schurmeier Motor Car Co., manufacturers of motor trucks at St. Paul, filed a petition of voluntary bankruptcy on August 2. The company has been manufacturing motor trucks about one year. Total liabilities are \$51,899.79 and total assets \$33,288.34. John P. Galbraith was appointed receiver.

A petition of creditors asking that the Dundee Manufacturing Company of Dundee, Ill., be adjudged bankrupt, filed August 18 in the United States District Court in Chicago, was followed by an admission and voluntary petition. The Bradley Iron Works claims \$1,365, William L. Newman \$500 and Victor Houser \$200. The concern had been attempting to absorb the Elgin Wagon Company, also bankrupt.

The Norwalk (Ohio) Motor Car Company was adjudged bankrupt August 3 by Judge Killets, of the federal district court at Toledo. A. J. Schur, of the law firm of Wing, Myler & Turney, of Cleveland, was appointed receiver, with a bond of \$20,000. The proceedings were brought by the Diamond Rubber Company, of New York; the Pennsylvania Rubber and Supply Company, of Cleveland, and the Cross-Gilchrist Advertising Company, of Cleveland. The plant will be operated by the receiver.

With the consent of a score of attorneys interested in the

affairs of the Columbia Carriage Co., C. T. Martin, John Gardner and John Schweizer, of Hamilton, O., were named on August 10 by the court to appraise the plant, which may be sold later as a running concern. Two days later the petitioning creditors who sought to have the company declared a bankrupt, filed their exceptions to the report of Special Master Commissioner Haines, who had declared to the United States court that the Columbia Company had committed no act of bankruptcy.

A petition asking that John Hite and Charles Clark, of Franklin, Ind., composing the firm of Hite & Clark, carriage manufacturers, be adjudged bankrupt, has been filed in the federal court at Indianapolis, Ind., by the Franklin National Bank, Adrian Shaffer and Raymond H. Sellers, all of Franklin, who presented claims aggregating \$10,540.89. The claim of the bank, which is the largest creditor of the three petitioners, amounts to \$10,500, the bank holding promissory notes to that amount. According to information from Franklin Clark said he knew nothing of the firm's financial condition, as this part of the business was managed by Hite. It was proved that both members of the firm had transferred their individual property within the last three months to relatives.

FIRES.

Fire damaged the carriage and harness repository of Seiger Bros. at Kansas, O.

The stock of buggies and wagons of H. L. Cook, Palestine, Tex., was destroyed by fire.

The stock of vehicles, etc., of Mayberry Bros., in Clarence, Okla., has been damaged by fire.

Fire at the wagon manufacturing plant of George S. Weir, Etna, Pa., caused a loss of \$40,000.

The stock of vehicles and implements of T. G. Lockett Company, Abilene, Tex., was destroyed by fire August 16. Loss about \$12,500.

Fire destroyed the plant of the Ellis Carriage Works at Kinston, N. C., August 20. It was the largest buggy manufacturing plant in the state. Loss, \$80,000; insurance \$35,000.

PERSONAL.

Gus Myrah was made manager of the implement and vehicle house of Robinson & Co., in Spring Grove, Minn.

A. M. Todd, of the Luehrmann Hardwood Lumber Co., St. Louis, was severely injured in Chicago, while on the way to the railroad station, in a taxicab.

B. W. Heath, head bookkeeper for the Studebaker Corporation, has been transferred to the Minneapolis office of the company, and assumed his new position about August 15.

F. M. Lay has recently become associated with the White Hickory Wagon Mfg. Company at East Point, Ga., in the capacity of superintendent and general manager of the factory.

H. H. Goodall, a vehicle dealer of Atlanta, Ga., was recently in Chattanooga, Tenn., with the object of selecting a location in the latter named city to which to move his vehicle business.

A. H. Worrest, manager of the Automatic Axle Co., Lancaster, Pa., reports a good year for his company considering all conditions, and says he believes that the coming year will be better.

L. T. Hauseman, who has been manager of the St. Louis branch of the Studebaker Corporation, has resigned and has taken over the St. Louis territory for the Overland line of automobiles.

William M. McMorro, one of the best known buggy men in the South, is now associated with the Taylor-Cannady Carriage Company, Oxford, N. C. He has been assigned the trade in South Carolina and northern Georgia.

The J. I. Case Plow Works has added two new travelers. E. E. Holland, formerly with the J. W. Moon Buggy Co., and with the John Deere Plow Company, will represent it in northern Kansas. C. O. Wilson, formerly with the Litchfield Manufacturing Company, will travel in eastern Nebraska.

OBITUARY

John Curley, a carriage maker of New York, died at Badgastein, Austria, on August 1, according to a cable dispatch received from the Consul-General at Vienna. He was traveling unaccompanied. John Curley, aged 70, once owned the carriage business still being conducted under his name at the corner of Clinton and State streets, Brooklyn, by Joseph M. Palmer, as manager. Mr. Curley retired fourteen years ago and spent most of his life since then in foreign travel. A letter lately received by Mr. Palmer from him said that he intended to go next to Asia Minor. His estate is estimated to be worth about \$500,000. Mr. Curley was a bachelor and lived, when in Brooklyn, at the Hotel St. George.

August Schmieder, carriage manufacturer of Columbus, O., died on his 72nd birthday, having been born in Guendlingen Baden Germany, on June 14, 1839. He came to America at the age of seventeen years and learned the carriage makers' trade. In 1867 he started in business, which he conducted up to the time of his death. A son, Henry, who was associated with him in business, and two daughters, survive him.

Herman Born, aged 82, prominent wagon manufacturer, died at his home in Baltimore, August 17, after a short illness. He was born in Biedenkopf, in Hesse-Darmstadt, Germany, and came to this country in 1850, founding the house of Herman Born two years later and continuing as its actual head until 1903. Mr. Born is survived by his wife and six children, seven grandchildren and two great grandchildren.

Henry C. Kirchner, founder of the Peoria Carriage Company, Peoria, Ill., died at Palma Sola, Fla., September 8, after an illness of several years. He is survived by the widow, two sons and two daughters. His son, Henry F., and his partner, H. J. True, will continue the business.

Thomas P. Skelly, proprietor of the Philadelphia Carriage Bolt Works, died on July 27, at his summer home near Atlantic City. Mr. Skelly succeeded to the business of his father, Thomas Skelly, in 1903. A widow and two children survive him.

John Croft—The death is reported of John Croft, the well known carriage manufacturer of Burlington, N. J. Mr. Croft succumbed to heart trouble on July 26. He was eighty years of age.

John Bray, aged 54, carriage builder of Chester, Pa., was found dead in bed by his wife on September 5.

THE NO. 15 PIANO BODY.

The Excelsior Seat Company, of Columbus, Ohio, are past masters in the art of body and seat building. They have been at it for years, always with increasing approval for the product of the shop. Ingenuity and patient experiment have now added a new feature to the former good. It is well shown in the No. 15 Excelsior piano-body. The object has been the improvement of details or construction, those little items that loom up so big in use because of their comfort and convenience. In this body sills and floor are constructed with allowance for free escape of water.

Supports for the floor and its attachment to the body are provided for by using four inside metal supports attached to the underside of the sills at each inside corner of the body; and a steel cross brace attached to the side sills at a suitable distance from the front of the body.

The four inside corner supports are attached on the under side and membered flush with the bottom of the sills and are secured to both the side and end sills by means of bolts and screws, the bolts in each passing upwards and through the lap joint formed by the sills at this point. The cross brace is secured by means of bolts passing downward through the side sills. These four corner supports and the steel cross brace form the bearings on which the floor rests when attached to the body.

A NEW WHEEL COMPANY.

The Standard Wheel Co., of Toledo, O., a department of the Standard Steel Tube Co., is announcing its new patent all-steel buggy wheels. This wheel has very much the appearance of a sarven patent wheel. The spokes are made of high grade bicycle steel tubing. The hubs are made of malleable iron and the rim of a special made steel. The tire is of a special design of the company. The wheel is neat and stylish in appearance, and has already proven its ability to stand the most severe tests. The method of construction is somewhat new in wheel building, and the company seems to have overcome every objection to steel wheels. These wheels will fill a long-felt want of the carriage trade.

GOOD VERMIN-PROOF PASTE.

The Buckeye Paste Co., of Columbus, Ohio, has for fifteen years been catering most satisfactorily to the carriage trade. The carriage trimmer is an adherent of Buckeye Paste, and since the advent of the automobile, that too, has come into line as a user of the company's products. R. Hartman, who is an expert, particularly at making vermin-proof paste, has lately taken over the management of the concern, and is waking up the trimmer as to the merit of the No. 38 Special Vermin-Proof Paste. This is an article of peculiar merit, and those unfamiliar with it ought to know something about it.

A GREAT CATALOGUE.

Catalogue No. 8 just issued by The Eberhard Manufacturing Company is a trade directory of vehicle irons of malleable construction. In its thousand pages is to be found the most comprehensive, all-including line of hardware we ever saw gathered between the covers of such a publication. The work of compilation must have been a great strain on all concerned and accomplishments are due on results achieved. Besides staples there are many new items. This catalogue ought to be found on your desk.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word; Initials and figures count as words. Minimum price, 30 cents for each advertisement.

POSITION WANTED.

Situation Wanted—By an all-round carriage and automobile painter, striper and finisher. Prefer job in small carriage shop in small town, to take charge. Address Box 144, Jamestown, Ohio.

Foreman Trimmer with ten years experience on high grade landaulettes, limousines, touring cars and automobile tops, will be open for position in September. Eastern man with results. Address Eastern, care The Hub, 24 Murray St., New York.

Foreman Blacksmith—Long Experience on all kinds of carriages and wagons from a push cart to the finest auto. Business wagons a specialty. Address R. R., care The Hub, 24 Murray St., New York City.

FOR SALE.

For Sale—Two top stitching and one bow dressing machines cheap. Address Western Carriage Works, St. Louis, Mo.

HELP WANTED.

Old established carriage, wagon and motor car factory near New York wants a capable blacksmith, an experienced woodworker, and a painter competent to run shop. Address for interview, A. C. B., The Hub, 24 Murray St., New York.

AGENTS WANTED.

Wanted—First class salesman wanted to carry our line of thill couplers and axles, as a side line. Something thoroughly tried and proven a great success. With our liberal commission all workers are making big money. For particulars address Chas. Schabinger, Marshall, Mich., stating territory covered.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

Studebaker

**BENT SPLIT REACH
BUGGY GEAR**

A practical buggy gear, that is really new, unusually attractive, strong, flexible, neat and novel.



**SEE THIS
GEAR**

and many other new and exclusive Studebaker features on our 1912 buggy line at

Tri-State Vehicle Exhibit

CINCINNATI, OHIO

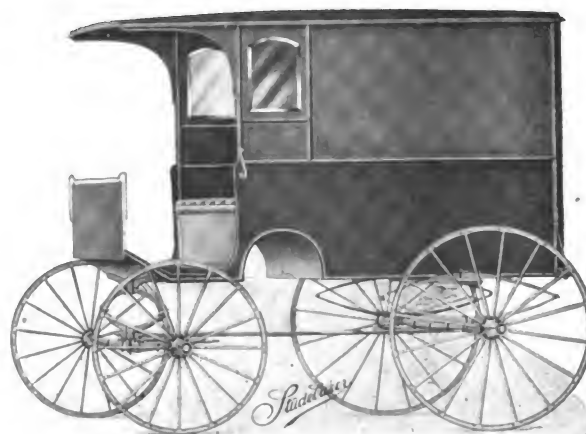
OCTOBER 23 to 28

Studebaker

**STEEL PANEL SIDE
FANCY DELIVERY WAGON**

The very latest in delivery wagon construction, light in weight, strongly built, fully guaranteed—a most practical general purpose vehicle.

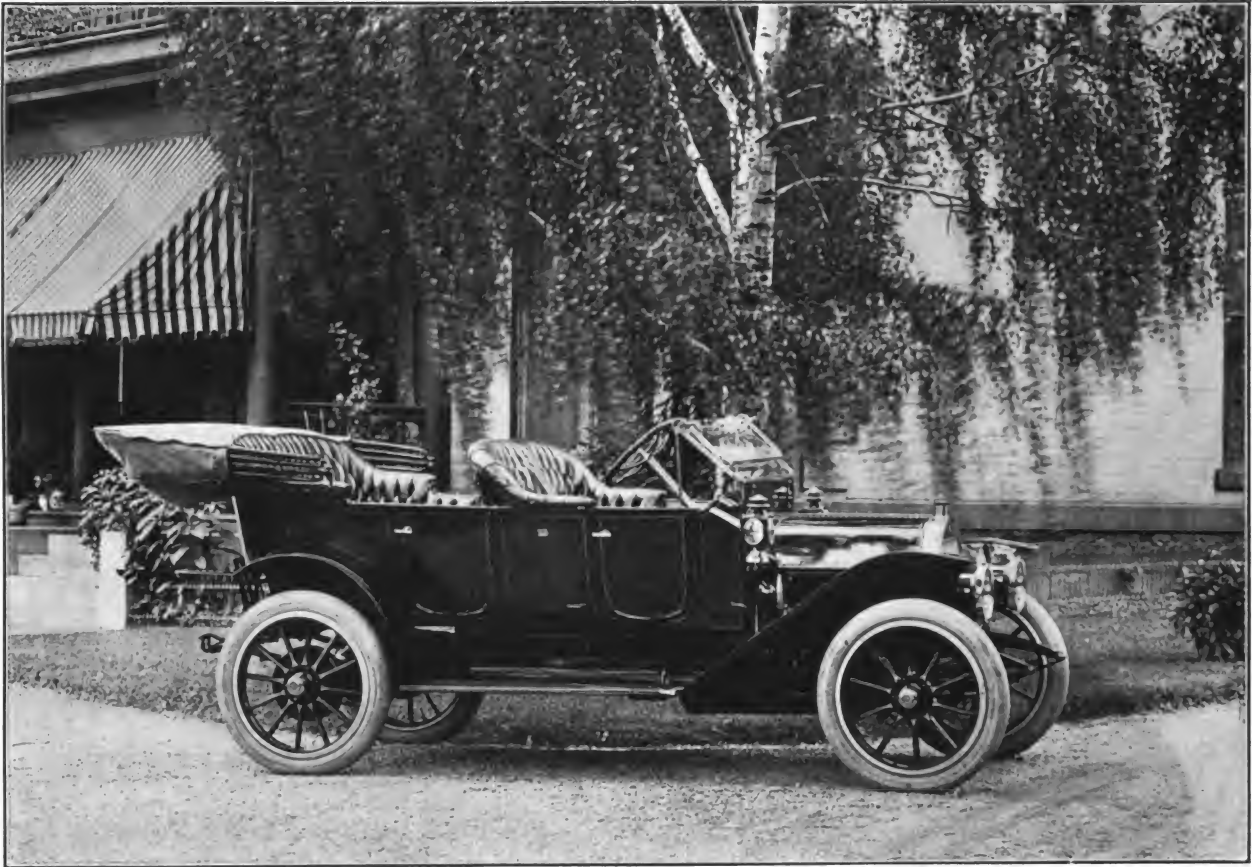
**THE
STUDEBAKER CORPORATION
SOUTH BEND, INDIANA**



A LARGE DISPLAY
OF FARM WAGONS,
DELIVERY WAGONS
AND BUGGIES SHOW-
ING OUR 1912 STYLES
WILL ALSO INTER-
EST YOU.=====

Adv. No. 1593.

"It's All Level Road to a Moyer"



THE MOYER 1912 TOURING CAR

Four and Six-Cylinder Fore-Door Touring Cars,
Runabouts and Limousines

The Same High Quality, Proportion and Finish that
have made Moyer Carriages a Standard the country over.

"If it is a Moyer it is all right"

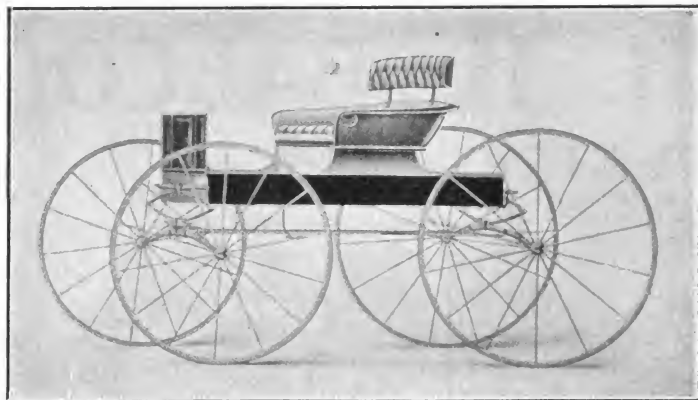
Send for catalogue giving detailed description

H. A. MOYER

Designer and Builder of Fine Carriages and Automobiles

Syracuse, N. Y.

Please mention "The Hub" when you write.



PETERS BUGGY COMPANY

COLUMBUS, OHIO

Mail us your address for our 1912 Catalogue. Our line for next season ENLARGED and PERFECTED.

We shall exhibit at

CINCINNATI TRI-STATE SHOW, OCTOBER 23 TO OCTOBER 28

Our Two Improved Patterns of Storm Buggy

Which include our special feature of **ROLLER BEARING DOOR HANGER**.

Also a representative selection from our full line of **BUGGIES, SURREYS, PHAETONS** and **RUNABOUTS**

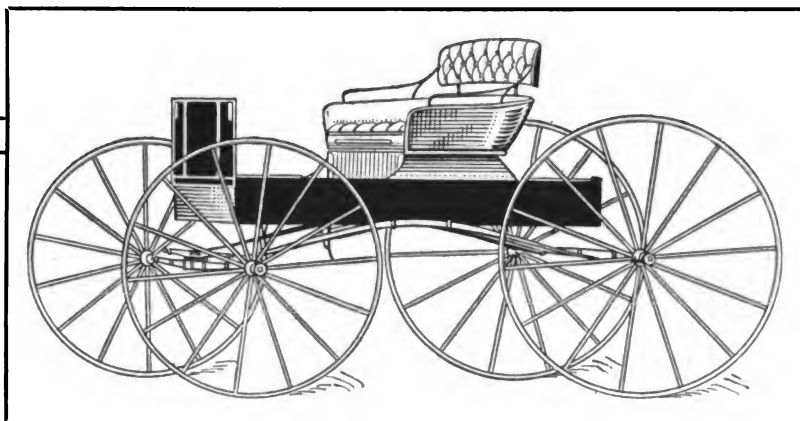
CALL THERE AND SEE US.



H. H. BABCOCK COMPANY

WATERTOWN

NEW YORK



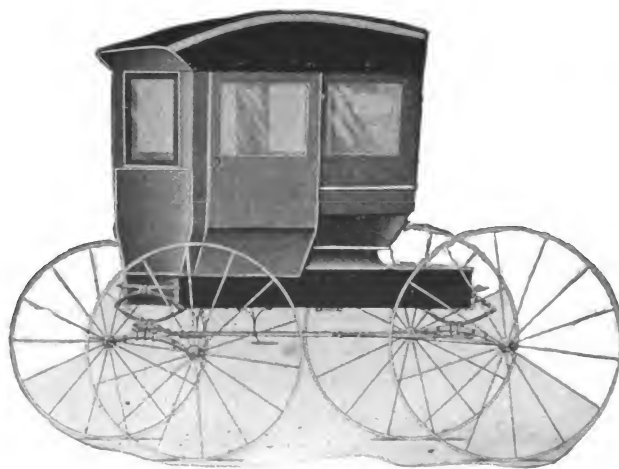
ONE OF THE LARGEST CARRIAGE BUILDERS IN THE
UNITED STATES

WRITE US FOR CATALOGUE.

The Colonial Carriage Company

Circleville, Ohio

There is a
demand for these
Storm Buggies



Have you taken
the time to
investigate the
reason for this

Our Storm Buggy is equipped with the Celebrated and Extensively Copied Colonial Gears

Write for Prices

Please mention "The Hub" when you write.

THE FOR MODERN CAR WAYS



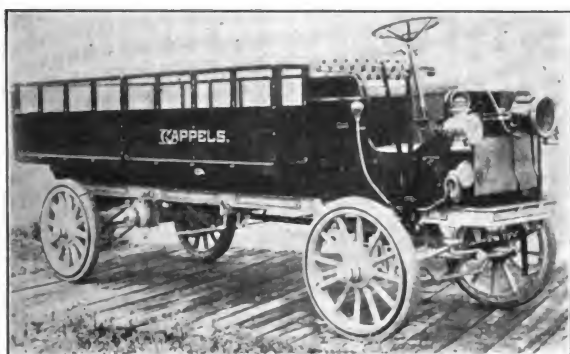
Model A—Engine, 30 H.P. 4-cycle; transmission, selective; wheels, 36x2, 36x3½ in. solid; capacity, 1500-2000 lbs.

Model B—Engine, 22 H.P. 4-cycle; transmission, selective; wheels, 32x3½, 33x4 in. pneumatic; capacity 500-1000 lbs.

QUIET RUNNING BUT POWERFUL
BEST SHOWING in Chicago-Detroit Reliability Contest. The ONLY CAR in its class making ENTIRE RUN ON ITS OWN POWER



THE BOWLING GREEN MOTOR CAR CO., BOWLING GREEN, O.



The GRAMM is made in 1, 2, 3 and 5-ton models

Reorders Prove Worth of GRAMM TRUCKS

More than twenty-five per cent. of the business houses that have bought Gramm Trucks have already reordered. No greater tribute can be paid to Gramm efficiency. No greater proof can be offered that the Gramm is the truck that can be bought with the full assurance that it will make good.

Write to-day—tell us the conditions you wish to meet

THE GRAMM MOTOR CAR COMPANY

107 South Lima Street,

LIMA, OHIO, U. S. A.



BROOKSHIRE & ROBINSON

Successors to The Walborn & Riker Co.

MANUFACTURERS OF

**Pony, Cob and Full Size Vehicles
For Home and Export Trade**

SAINT PARIS, OHIO, U. S. A.

Please mention "The Hub" when you write.

Fall Trade Novelties

A Wide Variety in

TRAPS, STANHOPES, CUT-UNDER DRIVING WAGONS, PHAETONS AND SURREYS

Ready for Prompt Shipment



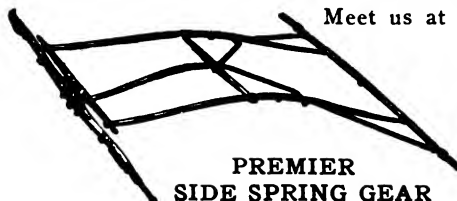
No. 81—Aurora Surrey and Stanhope.

A Trial Order will win for you a satisfied customer and pave the way for further profitable sales. Catalogue and prices on application.

Staver Carriage Co.
Chicago, Ill.

VEHICLES AND GEARS IN THE WHITE

Meet us at C.B.N.A.



**PREMIER
SIDE SPRING GEAR**

We also manufacture a full line of Carriage and Wagon Bodies in the white; also Limousine, Taxicab, Touring Car and Roadster Bodies for Automobiles in metal. Fifty styles of gears for Carriages and Wagons; also seats, trimmings and tops of all kinds.

Write to us for particulars.

SCHUBERT BROS. GEAR COMPANY
ONEIDA, NEW YORK

S. R. BAILEY & COMPANY, Inc.

Makers of the Celebrated.

WHALEBONE ROAD WAGON

AMESBURY, MASS.

FRED. BUSSE, Pres. and Treas.

M. DANZIGER, Vice-Pres.

JOHN F. GOULD, Sec'y.

THE UNITED STATES VARNISH CO.

GOOD
GOODS



INTERESTING
PRICES

MANUFACTURERS FINEST VARNISHES
2616-2618 COLERAIN AVENUE, Telephone, West 359 CINCINNATI

TRADE VALENTINE MARK.

If you had to get up a list of the best carriage and automobile trade in the country

you couldn't select a more representative list than that in the HUB STYLE PORTFOLIO could you?

More than 80 per cent. of the manufacturers on this list are customers of ours.

Judge whether the eighty years we have spent in learning how to make varnish have been well spent.

Judge whether our varnishes would be likely to satisfy you.

Note that some of the concerns on this list make the highest priced carriages and automobiles in the world, and that others are noted the world over for their low-priced carriages.

We furnish varnishes and colors to both.

If you would like to know about a varnish good enough for \$8,000 motor cars, and economical enough for \$20 buggies write for our Vanadium Varnish book.

Valentine & Company

257 Broadway, New York.

Chicago

Boston

Toronto

Paris

Amsterdam

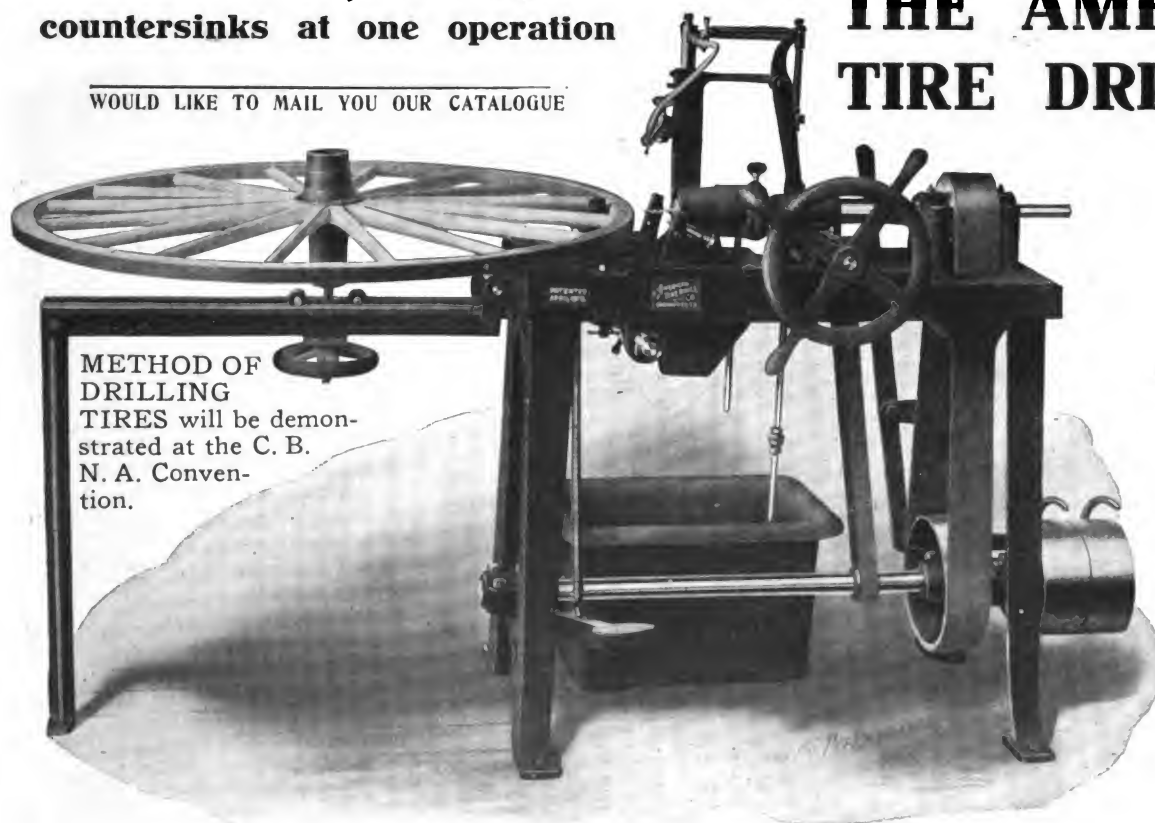
Please mention "The Hub" when you write.

INDEX TO ADVERTISERS

Acme Rubber Mfg. Co.	31	Fabrikind Co.	3	Ochsner, A. & Sons Co.	36
American Tire Drill Co.	21	Fairfield Rubber Co.	38	Ohio Seat Co.	36
Ault & Wiborg Co.	12	Frost Gear & Machine Co.	34	Oliver Typewriter Co.	37
Babcock, H. H. Co.	18	Gerhab, Jacob	38	Payne, E. Scott & Co.	22
Balley, S. R. & Co.	20	Gifford, John & Son	11-36	Peters Buggy Co.	17
Blacknell Mfg. & Supply Co.	38	Goodrich, B. F. Co.	5	Pettingell Machine Co.	26
Bokop, Webb & Palm	36	Gramm Motor Truck Co.	19	Pierce, F. O. Co.	9
Bowling Green Motor Car Co.	19	Herbrand Co.	34	Porter, H. K.	32
Brookshire & Robinson	19	Hildreth Varnish Co.	4th cover margin	Powitzky & Collins C. W. W. Co.	30
Buckeye Handle, Gear & Bending Co. ..	38	Higgin Mfg. Co.	4th cover	Racine Auto Tire Co.	30-31
Buckeye Paste Co.	36	Hoopes Bros. & Darlington	2nd cover	Raser Tanning Co.	35
Burling, W. G.	36	Indianapolis Dash Co.	12	Relly, John, Inc.	37
Buser-Poston Tufting Machine Co.	24	Jones, Phineas & Co.	32-38	Richmond Lamp Co.	32
Chalfonte Hotel	7	Keystone Paint & Filler Co.	36	Russell, Burdall & Ward Bolt & Nut Co.	3rd cover
Chase, L. C. & Co.	11	Keystone Spring Works	38	Schubert Bros. Gear Co.	20
Cincinnati & Hammond Spring Co.	22	Landers Bros. Co.	31	Sheldon Axle Co.	2nd cover
Cleveland Axle Mfg. Co.	23	Latham Hotel	37	Sherwin-Williams Co.	7
Cleveland Hdwe. Co.	4	Lewis Spring & Axle Co.	23	Shortsville Wheel Co.	35
Consolidated Rubber Tire Co.	33	Lounsbury, G. H. & Son	34	Standard Wheel Co.	25
Cortland Carriage, Goods Co.	28	Masury, John W. & Son	8	Standard Oil Cloth Co.	6
Cortland Forging Co.	34	Mayo Radiator Co.	32	Staver Carriage Co.	20
Colonial Carriage Co.	18	McKinnon Dash Co.	4th cover	Stinson, Edw. Mfg. Co.	36
Columbus Bolt Works	4th cover	Metropolitan Lamp Co.	32	Studebaker Corporation	15
Cooper Carriage Woodwork Co.	27	Moller & Schumann Co.	9	Timken Roller Bearing Co.	1
Cowles, C & Co.	32	Moore, Benj & Co.	36	Union City Wheel Co.	25
Crane & McMahon	2nd cover	Moyer, H. A.	16	United Rim Co.	2
Crandal, Stone & Co.	22	Murray, Wm. A.	12	U. S. Varnish Co.	20
Crowe Nameplate & Eng. Co.	36	National Spring & Wire Co.	35	U. S. Woodworking Co.	35
Decker, J. C.	37	New Wapakoneta Wheel Co.	1	Valentine & Co.	9-20
Devoe, C. T. & Reynolds Co.	3rd cover	Noelty Tufting Machine Co.	3rd cover	West Tire Setter Co.	27
Diefenthaler, J. V.	30			Woodman, Joel H.	36
Douglas & Lomason	9			Willey, C. A. & Co.	10
Eberly & Orris Mfg. Co.	3rd cover			Wilcox Mfg. Co.	29
Eccles, Richard Co.	36			Wiggers Furniture Co.	4th cover
Excelsior Seat Co.	35				
Eureka Bending & Wheel Works	33				

**Drills the tire, felloe and
countersinks at one operation**

WOULD LIKE TO MAIL YOU OUR CATALOGUE



METHOD OF
DRILLING
TIRES will be demon-
strated at the C. B.
N. A. Conven-
tion.

**THE AMERICAN
TIRE DRILL CO.**

CINCINNATI, D.

Invite you to a
demonstration of the
MODERN METHOD
OF DRILLING

**VEHICLE
WHEELS**

at the
CARRIAGE BUILDERS'
NATIONAL
CONVENTION, AT
ATLANTIC CITY, N. J.

Please mention "The Hub" when you write.

All Styles of Springs for Motor and Horse Vehicles

STEELS SPECIALLY HEAT-TREATED



Here is a beauty, and for easy-riding qualities and durability it is without a peer.

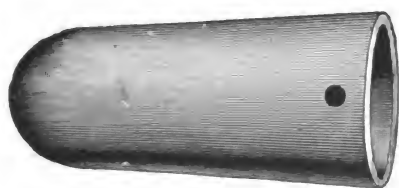
CINCINNATI & HAMMOND SPRING COMPANY

909-923 Summer Street, CINCINNATI, OHIO.

TAKE A TIP FROM ME

The fellow who cuts his corners too close and substitutes cheap stuff here and there usually wakes up—too late—to find his business gone to the “bow-wows.” It costs but little more in the beginning and is cheaper in the end to use “dyed-in-the-wool” goods with a history and a reputation.

AS AN EXAMPLE:



No. 20 SHAFT TIP is first tinned on steel and then given a coat of nickel—a generous one too. The finish sticks and always has that glossy, substantial look that bespeaks superior quality. Measures $\frac{7}{8}$ x $1\frac{3}{4}$ inches. We have other sizes too. It will pay you to write.

CRANDAL, STONE & CO.,

BINGHAMTON,
NEW YORK



Please mention "The Hub" when you write.

"Cleveland" Axles

Are known for their practical superiority,
perfect interchangeability and finish, and cost
no more than axles of inferior quality.

No. 6½ Concord Express

For all kinds of
Wagon and Truck Work.
"The Axle that Outwears
the Wagon."

Cleveland Axle Mfg. Co.

Canton, Ohio

Cleveland-Dalzell

For the
Highest Grade Vehicles.
Wrought Iron Case-Hardened
Boxes Wear Forever.

We Manufacture a Complete Line of

**Half-Patent, Common Concord, No. 6½ Concord Express,
Cleveland-Dalzell, Doctor's Special, Pray
Spring Washer Axles**

Would be glad to receive your inquiries and can serve you promptly.

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

SPRINGS

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

Please mention "Harness" when you write.

ADVERTISEMENTS CLASSIFIED

AUTOMOBILES

Babcock, H. H. Co., Watertown, N. Y.
 Ballev, S. R. & Co., (elec.) Amesbury, Mass.
 Moyer, H. A., Syracuse, N. Y.
 Staver Cge. Co., Chicago, Ill.
 Studebaker Corporation, So. Bend, Ind.

AXLES

Cincinnati & Hammond Spring Co., Cincinnati, O.
 Cleveland Axle Mfg. Co., Canton, O.
 Lewis Spring & Axle Co., Jackson, Mich.
 Sheldon Axle Co., Wilkes-Barre, Pa.
 Timken Roller Bearing Co., Canton, O.

BODIES, SEATS, ETC. (Wood and Metal)

Burling, W. G., Philadelphia, Pa.
 Excelsior Seat Co., Columbus, O.
 Ohio Seat Co., Cincinnati, O.
 Powitzky & Collins C. W. Co., St. Louis, Mo.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Wiggers Furniture Co., Cincinnati, O.
 Woodman, Joel H., Hoboken, N. J.
 U. S. Woodworking Co., Buffalo, N. Y.

BOLTS AND NUTS

Columbus Bolt Works, Columbus, O.
 Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.

BUGGIES

Babcock, H. H. & Co., Watertown, N. Y.
 Bailey & Co., S. R. Inc., Amesbury, Mass.
 Brookshire & Robinson, Saint Paris, O.
 Colonial Carriage Co., Circleville, O.
 Moyer, H. A., Syracuse, N. Y.
 Staver Carriage Co., Chicago, Ill.
 Peters Buggy Co., Columbus, O.
 Studebaker Corporation, So. Bend, Ind.

CARRIAGE FORGINGS.

Cleveland Hardware Co., Cleveland, O.
 Columbus Bolt Works, Columbus, O.
 Cortland Forging Co., Cortland, N. Y.
 Eccles Co., Richard, Auburn, N. Y.
 Herbrand Co., Fremont, O.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.
 Cortland Carriage Goods Co., Cortland, N. Y.
 Crandal, Stone & Co., Binghamton, N. Y.

CARRIAGES AND WAGONS (Finished)

Babcock, H. H. & Co., Watertown, N. Y.
 Ballev & Co., S. R., Amesbury, Mass.
 Brookshire & Robinson, Saint Paris, O.
 Colonial Carriage Co., Circleville, O.
 Moyer, H. A., Syracuse, N. Y.
 Staver Carriage Co., Chicago, Ill.
 Peters Buggy Co., Columbus, O.
 Studebaker Corporation, So. Bend, Ind.

CARRIAGE, WAGON AND AUTOMOBILE HARDWARE, SUPPLIES, ETC.

Gifford & Son, John A., New York City.
 Higgin Mfg. Co., Newport, Ky.
 Payne Co., E. Scott, Baltimore, Md.
 Gerhab, Jacob, Philadelphia, Pa.
 Crandal, Stone & Co., Binghamton, N. Y.
 Cowles & Co., C., New Haven, Conn.
 Landers Bros. Co., Toledo, O.
 Cortland Forging Co., Cortland, N. Y.
 Cortland Carriage Goods Co., Cortland, N. Y.

COMMERCIAL MOTOR WAGONS, TRUCKS

Bowling Green (O.) Motor Car Co.
 Gram Motor Truck Co., Lima, O.
 Studebaker Corporation, So. Bend, Ind.

DASHES, FENDERS, ETC.

Indianapolis Dash Co., Indianapolis, Ind.
 McKinnon Dash Co., Buffalo, N. Y.
 Burling, W. G., (Metal) Philadelphia, Pa.

FIFTH WHEELS.

Wilcox Mfg. Co., D., Mechanicsburg, Pa.
 American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.
 Cleveland Hdwe. Co., Cleveland, O.

GEAR WOODS.

Cooper Cge. Woodwork Co., St. Louis, Mo.
 Buckeye Handle, Gear & Bending Co., Alliance, O.
 Eureka Bending & Wheel Works, York Pa.

LEATHER, PATENT AND ENAMELED

Diefenthaler, J. V., Newark, N. J.
 Raser Tanning Co., Ashtabula, O.
 Reilly, John, Inc., Newark, N. J.

MALLEABLES.

Eberhard Mfg. Co., Cleveland, O.

MACHINERY AND TOOLS.

American Tire Drill Co., Cincinnati, O.
 Buser-Poston Tufting Machine Co., Chillicothe, O.
 Novelty Tufting Machine Co., Chicago, Ill.
 Bokop, Webb & Palm, Defiance, O.
 Porter, H. K., Everett, Mass.
 West Tire Setter Co., Rochester, N. Y.
 Frost Gear & Machine Co., Jackson, Mich.
 Pettinell Machine Co., Amesbury, Mass.
 Lounsbury, G. H. & Sons, Cincinnati, O.

MACHINERY, (Woodworking)

Rentel & Margedant Co., Hamilton, O.
 Ricknell Mfg. & Supply Co., Janesville, Wis.
 Pettinell Machine Co., Amesbury, Mass.

MOUNTINGS (Including Lamps)

Cowles & Co., C., New Haven, Conn.
 Crowe Name Plate & Engraving Co., Chicago
 Ochsner & Sons Co., A., New Haven, Conn.
 Richmond Mfg. Co., Richmond, Ind.
 Metropolitan Lamp Co., Newark, N. J.

PASTE

Buckeye Paste Co., Columbus, O.

RADIATORS.

Mayo Radiator Co., New Haven, Conn.

RAILS.

Douglas & Lomasson Co., Detroit, Mich.

RIMS.

United Rim Co., Akron, O.

RUBBER TIRES

Autos, Pneumatics, Etc.

Acme Rubber & Mfg. Co., Trenton, N. J.
 Consolidated Rubber Tire Co., New York City.
 Goodrich Co., B. F., Akron, O.
 Racine Auto Tire Co., Racine, Wis.

Carriages, Solid, Etc.

Consolidated Rubber Tire Co., New York City.
 Goodrich Co., B. F., Akron, O.

SLEIGH RUNNERS.

Schofield & Co., Freeport, Ill.

SHAFT COUPLINGS.

Eccles Co., Richard, Auburn, N. Y.
 Higgin Mfg. Co., Newport, Ky.

SHAFT STRAPS.

Decker, J. C., Montgomery, Pa.

SPRINGS (Cushlon)

Murray, Wm. A., Cincinnati, O.
 National Spring & Wire Co., Jackson, Mich.

SPRINGS, GEARS, ETC.

Cincinnati & Hammond Spring Co., Cincinnati, O.
 Cleveland Canton Spring Co., Canton, O.
 Keystone Spring Works, Philadelphia, Pa.
 Sheldon Axle Co., Wilkes-Barre, Pa.
 Lewis Spring & Axle Co., Jackson, Mich.
 Schubert Bros. Gear Co., Oneida, N. Y.

TRIMMING MATERIAL

Rubber Drills, Enameled Goods, Imitation Leather, Etc.

Chase & Co., L. C., Boston, Mass.
 Fairfield Rubber Co., Fairfield, Conn.
 Lounsbury & Sons, G. H., Cincinnati, O.
 Acme Rubber Mfg. Co., Trenton, N. J.
 Standard Oil Cloth Co., New York City.
 Fabrikold Works, Newburg, N. Y.

VARNISHES, PAINTS AND JAPANS

Ault & Wiborg Co., Cincinnati, O.
 Devoe, F. W., and C. T. Reynolds, N. Y. C.
 Hildreth Varnish Co., New York City.
 Keystone Paint & Filler Co., Muncy, Pa.
 Moore & Co., Benj., Cleveland, O.
 Moller & Schumann Co., Brooklyn, N. Y.
 Masury & Son, J. W., New York and Chicago
 Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 U. S. Varnish Co., Cincinnati, O.
 Valentine Varnish Co., New York, Chicago, Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

VEHICLES.

Babcock, H. H. & Co., Watertown, N. Y.
 Bailey & Co., S. R. Inc., Amesbury, Mass.
 Brookshire & Robinson, Saint Paris, O.
 Colonial Carriage Co., Circleville, O.
 Moyer, H. A., Syracuse, N. Y.
 Staver Carriage Co., Chicago, Ill.
 Peters Buggy Co., Columbus, O.
 Studebaker Corporation, So. Bend, Ind.

WHEELS AND WHEEL STOCK.

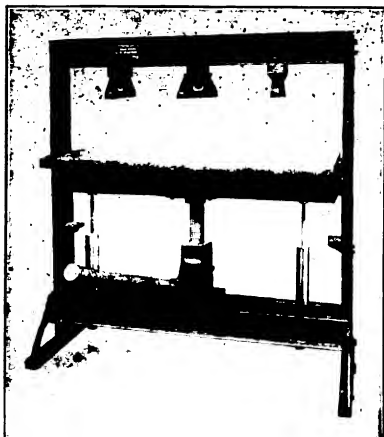
Crane & MacMahon, New York City.
 Eberly & Orris Mfg. Co., Mechanicsburg, Pa.
 Eureka Bending & Wheel Works, York, Pa.
 Union City Wheel Co., Union City, Ind.
 Gifford & Son, John A., New York City.
 Hoopes Bros. & Darlington, West Chester, Pa.
 Jones & Co., Phineas, Newark, N. J.
 New Wapakoneta Wheel Co., Terra Haute, Ind.
 Stinson Edw. W. & Co., Baltimore, Md.
 Standard Wheel Co., Terra Haute, Ind.
 Shortsville Wheel Co., Shortsville, N. Y.

WOOD STOCK, BENT WOOD, ETC.

Crane & MacMahon, New York City.
 Buckeye Handle, Gear & Bending Co., Alliance, O.
 Eureka Bending & Wheel Works, York, Pa.
 Gifford, John A. & Son, New York City.
 Cooper Cge. Wood Work Co., St. Louis, Mo.

MISCELLANEOUS

Chalfonte Hotel, Atlantic City, N. J.
 Oliver Typewriter Co., New York—Chicago



AS SWIFT AS A JACK RABBIT

Our new **LIGHTNING JACK RABBIT TUFTING MACHINE PRESS** is quicker in operation, easier operated and more powerful than any other hand power press on the market. It takes just twelve seconds to raise the platform to full height and lower the same. Scientifically correct in every detail. Would be pleased to quote you prices on same.

Ask for complete catalogue of our power driven and hand power presses, mould boards, button holders, plaiters, etc. Our new **All-Metal Button Holder** is perfect in every detail. Samples furnished upon application.

The Buser-Poston Tufting Machine Co.
 Chillicothe, Ohio



ASK FOR CATALOG

No. 10. Carriage and Wagon Wheels.

No. 15. Auto and Motor Truck Wheels.

WE HAVE—FOR FORTY YEARS
MADE
WHEELS OF QUALITY

¶ Our experience should be worth something to you.

¶ To buyers of wheels not already on our list of satisfied customers, we offer our facilities for producing wheels for

Carriages, Wagons, Automobiles and
Motor Trucks

OF THE HIGHEST STANDARD OF QUALITY

STANDARD WHEEL COMPANY
TERRE HAUTE, IND.



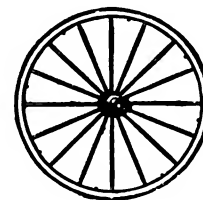
WHEELS
FOR THE
CARRIAGE TRADE



Thoroughly seasoned, carefully selected materials of best Indiana quality. Sarven, Warner and Shell Band Wheels. We operate our own supply plant in Southern Indiana.

Prompt Shipments guaranteed.

SEND FOR CATALOGUE AND PRICES



UNION CITY WHEEL COMPANY
UNION CITY, IND.

Please mention "The Hub" when you write.

METAL BODY MACHINERY

of PETTINGELL PATENTS forms the largest, if not the entire equipment of most every automobile body plant in the United States. This surely denotes superiority of the Pettingell line. These machines are also extensively used to do first class work in getting out body stock and frame work.

WRITE FOR CATALOGUE



NEW AUTOMATIC POWER HAMMER

Designed and made especially for Aluminum or Metal Body Work; gives plenty of room to form or turn body panels, seats, wide backs, etc. Is designed and built to run at a high rate of speed, and the peculiar construction with springs and belts preserves the bearings, pins and screws from racking or breaking.



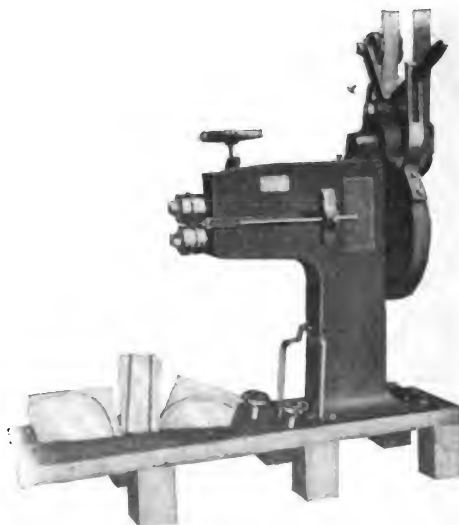
IMPROVED METAL ROLLER FORMER.

A solid, substantial machine, all metal, with cut gears. Will make any curve or various irregular curves on Mud Guards, Metal Panels, Seats, Etc.



HAND MOULDING OR BEADING FORMER.

Will form moulding or beading any size or shape, cuts all metals, will fold in wire around edge of metal and turn over flanges, etc. Intended for use in factories and shops where small machines are needed for much of the work that can be done quicker and easier than on large power machines, and also for many shops where they have not power or facilities or do not wish to put in the large, powerful and more expensive machines.



POWER MOULDING OR BEADING FORMER

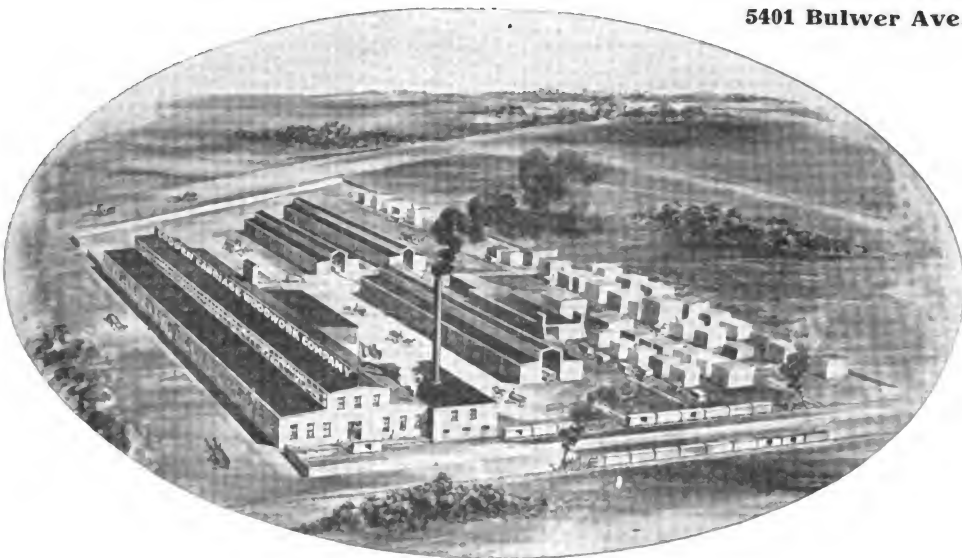
A big improvement over any machines formerly used for forming, beading or moulding; cutting all metals; turning over flanges or folding in wired edge of metal, or any part of the work, and combines three machines in one. Adjustable every way and quickly changed for any work. Designed and built to handle all kinds of metal, aluminum, sheet steel, copper or tin.

THE PETTINGELL MACHINE CO.
AMESBURY, MASSACHUSETTS

Please mention "The Hub" when you write.

COOPER CARRIAGE WOODWORK CO., ST. LOUIS, MISSOURI

5401 Bulwer Ave.



Our Specialty:

High Arch Axle Beds
We Bend All Our Axle Beds

GEARWOODS

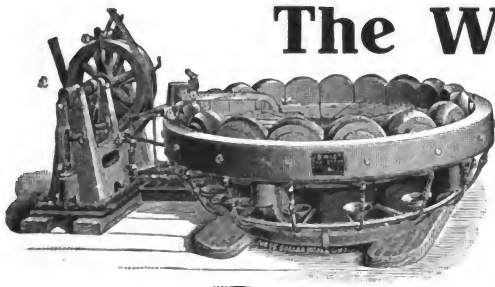
We are adding
Still More Machinery
Our Service will be
Better Than Ever

Let us Furnish
Your Gearwoods
For 1911 - 1912
Be Satisfied.

Get
The

"Cooper" Quality

There's
A
Difference



The West Hydraulic Tire Setter

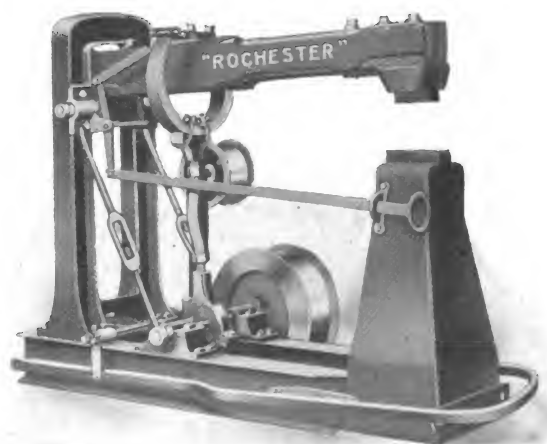
Is used by more people with a REPUTATION
TO MAINTAIN than is any other, for the reason
that it is the best machine ever invented for setting
tires cold. Our list of users will prove this.

OUR "Rochester" Helve Hammer

Will pay for itself in a few months in any
Carriage or Wagon factory or shop of import-
ance, as it will do a great variety of general
forging, tire and axle welding, etc. It is
built right and sold at a reasonable price.

Six sizes, one for your work. Our book-
let will explain. It's yours for the asking.

THE WEST TIRE SETTER CO.
ROCHESTER, N. Y.



Please mention "The Hub" when you write.

CORTLAND CARRIAGE GOODS CO.

ANNOUNCEMENT

We have recently installed modern machinery for the economical production of Bail Hangers, Body Hangers, Side Spring Hanger Frames, and Body Loops. It will be our aim to make forgings of the highest quality and smoothest finish.



SEND PATTERNS FOR QUOTATIONS

REPRESENTATIVES

Central States

A. E. Roninger

1110 N. Michigan St.
South Bend, Ind.

Eastern and Southern States

Jesse Jennison

Cortland
New York

Western States

A. W. Curtis

Kaiserhof Hotel
Chicago, Ill.

Export South American

C. A. Steyn

50 Church St.
New York City

Export Australia

R. W. Winning

Linden Court, Cor. Castlereagh & Market Sts.
Sydney, N. S. W. Australia.

Cincinnati and Vicinity

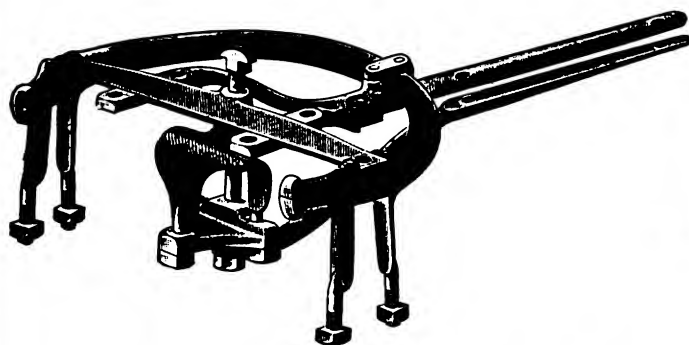
Melville Ritchie

Carriage Supply Co.
Cincinnati, O.

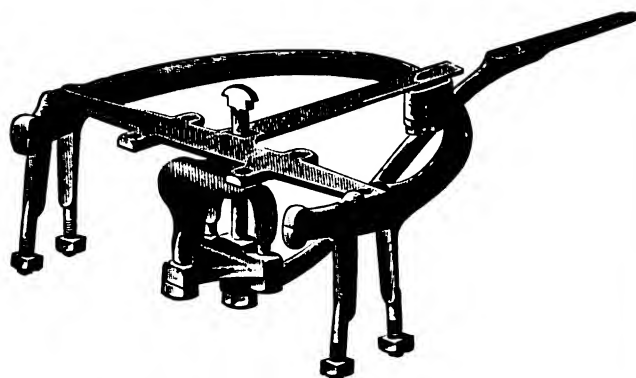
CORTLAND, NEW YORK, U. S. A.

Please mention "The Hub" when you write.

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



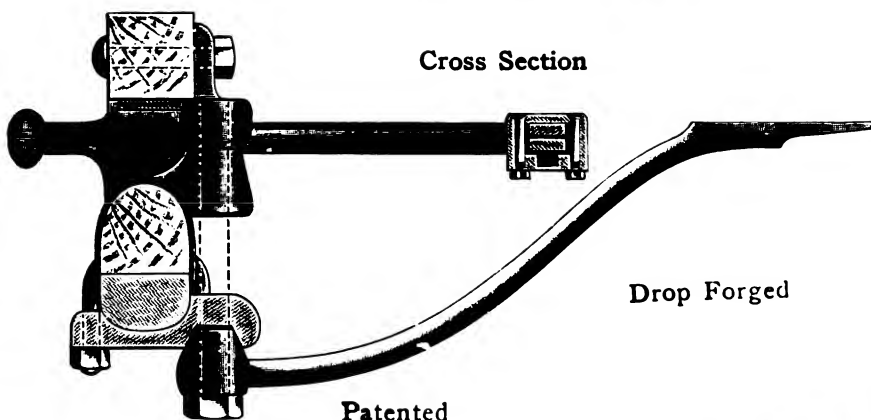
No. 1908—Gear Iron



No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.

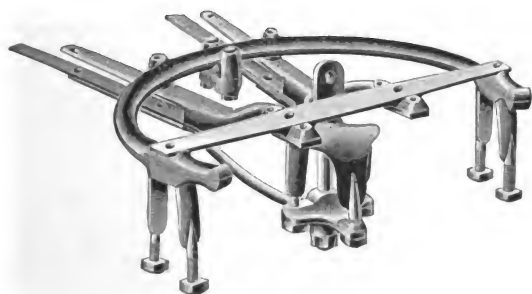


Cross Section

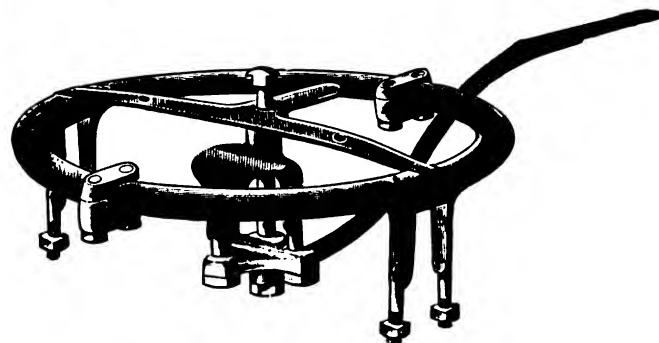
Drop Forged

Patented

S
U
R
E
S
A
F
E



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and that's good news involved in the handling of

THE RACINE AUTO TIRE

We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

Leather Buyers' Attention

See DIFENTHALER'S
Anti-Dope Leather at
Carriage Builders'
Convention

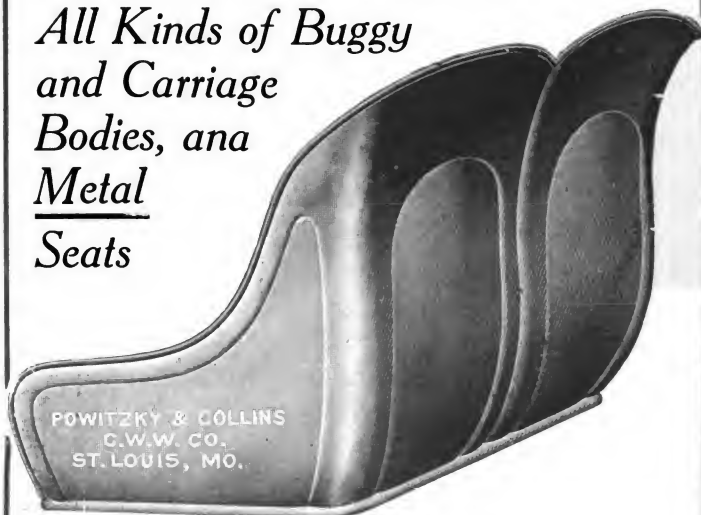
GUARANTEED no oil will come out.
Soft and pliable. DON'T CRACK.
High grade leather at a low price

JOHN V. DIFENTHALER
90 HAMILTON STREET
NEWARK, N. J.

POWITZKY & COLLINS Carriage Woodwork Co. ST. LOUIS, MO.

—Manufacturers of—

*All Kinds of Buggy
and Carriage
Bodies, and
Metal
Seats*



No. 923—Sunken Panel Metal Seat.

OUR METAL SEATS are made of the best cold-rolled, pickled, re-enameled, twenty-two gauge sheet steel, and primed with the best mineral paint.

Send for Sample and Be Convinced.
Mention Hub.

Please mention "The Hub" when you write.

CUSTOMER·A·SATISFIED·CUSTOMER

BECAUSE, those cup-like studs that you see in our illustration will grip the ground just where, and just when, the ground needs gripping; so that he is free from the danger of skidding and slipping.

BECAUSE, his tire EXPENSE account will show a difference such as will cause him to talk enthusiastically to others about you and the RACINE AUTO TIRE.

All this counts for good business; so get busy. The RACINE AUTO TIRE is going into the hands of live, pushing dealers. We shall make it equally advantageous to them as to us. Be amongst the live ones. Take our proposition. Do it now; and together let us do it thoroughly.

RACINE AUTO TIRE COMPANY

500 14th Street

RACINE, WISCONSIN



ACME AUTO TIRES AND CARRIAGE CLOTH

Insure safety and service UNDER
and OVER your automobile.

Acme Rubber Mfg. Co.
TRENTON, N. J.

BOSTON

CHICAGO

NEW YORK

LANDERS BROS. CO.

TOLEDO, OHIO

Importers and Manufacturers

BUCKRAM AND WEBBING

Transparent Celluloid, Bow and
Stay Lining, Enamelled Muslins,
Drills and Ducks, Cotton Sheetings,
Burlap, Cushion Canvas, Wadding.

PROMPT SHIPMENTS

LOWEST PRICES

OIL CARPET

OILED DUCK



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

¶ Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
New Haven, Connecticut

CARRIAGE, COACH AND AUTOMOBILE TRIMMINGS AND FORGINGS



ESTABLISHED 1838

NEW HAVEN, CONN., U. S. A.

E. SCOTT PAYNE CO. OF BALTIMORE CITY CARRIAGE AND AUTOMOBILE HARDWARE

362 and 364 North Gay Street,
BALTIMORE, MD.

H. WEICHHOLD

METROPOLITAN LAMP COMPANY

Manufacturing and Repairing of

AUTOMOBILE SEARCH and SIDE LIGHTS, COACH and CARRIAGE LAMPS

Makers of All Kinds of Metal Goods.

Nickle and Silver Plating

24 Mechanic St.,

Newark, N. J

L. D. Phone 2290-W Market

Please mention "The Hub" when you write.

Richmond

*Built Exclusively
for the
Carriage Trade*

*Send for our original
designs and attractive prices*

RICHMOND MFG. CO

*Richmond
Indiana*

Lamps

ESTABLISHED 1855

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

AUTOMOBILE WHEELS

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply the Standard Universal Quick Detachable and Quick Detachable Demountable Rims.

REPAIRING OF AUTOMOBILE TRUCK WHEELS.

PORTER'S BOLT CLIPPERS

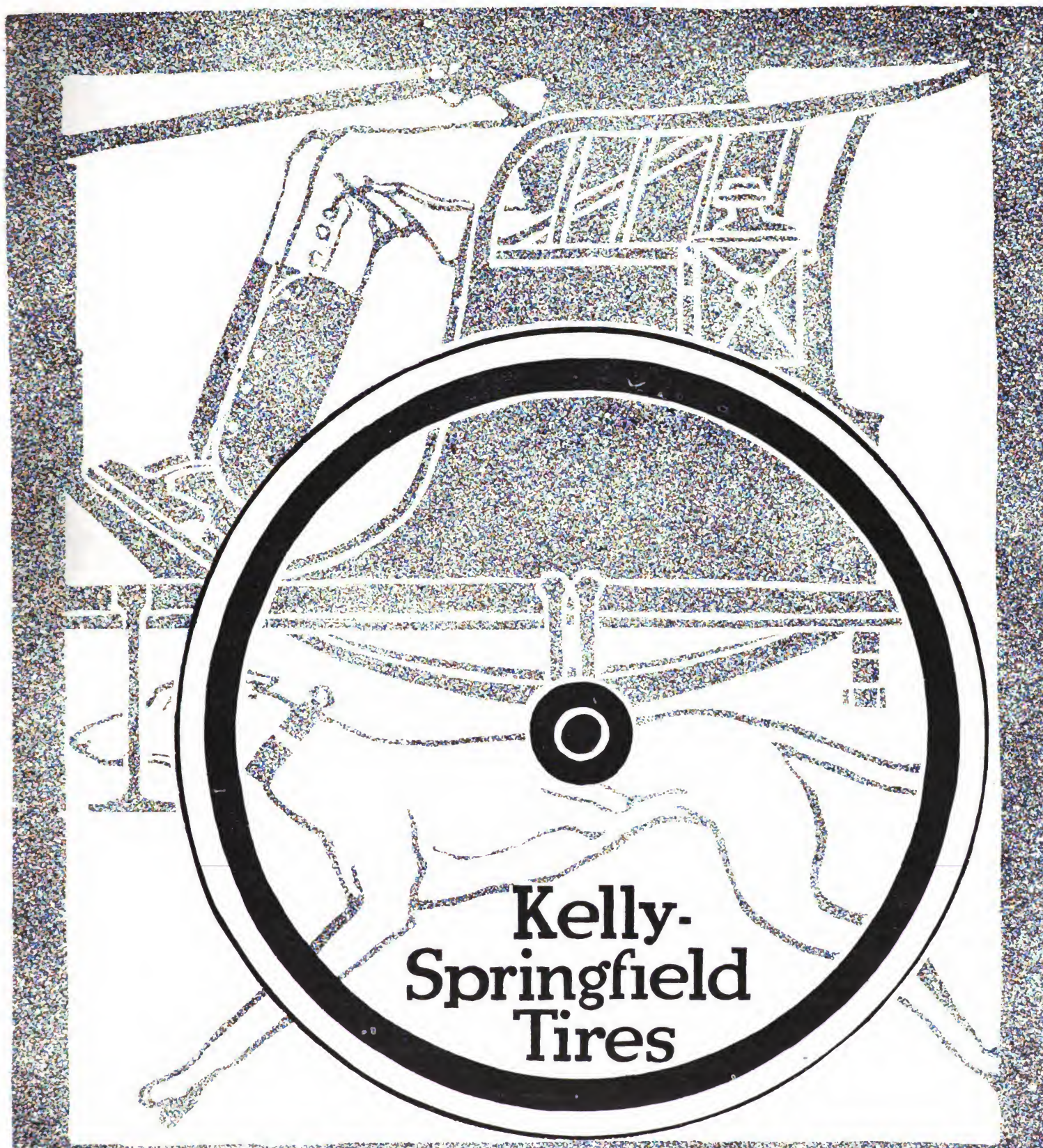
"Easy" "New Easy" Allen-Readall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 Inch.

H. K. PORTER,

EVERETT, MASS.



**Kelly-Springfield
Tires**

The last touch of distinction to a well made vehicle

CONSOLIDATED RUBBER TIRE COMPANY, 20 Vesey Street, New York
Branch Offices in
New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Atlanta and Akron, O



Bow Socket, No. 1004

Shifting Rail
No. 1115.

VEHICLE TOP FORGINGS

Of Every Description

No Need to Look Farther - Superior Goods
From One Factory in One Shipment.

For Buggy Tops, Auto Tops, Boat Tops

Write for Catalog F and Supplement
Secure Our Auto Gooseneck Hanger

CORTLAND FORGING COMPANY

CORTLAND, N. Y., U. S. A.

The Herbrand Company
Fremont, Ohio.

MANUFACTURERS OF
HIGH GRADE

CARRIAGE AND AUTOMOBILE
FORGINGS

AND DROP FORGED WRENCHES

GEARS

Our gears are theoretically correct, and
give the maximum amount of satisfaction.
Are you enjoying this BEST service?
If not, INVESTIGATE! NOW!

FROST GEAR & MACHINE CO.

JACKSON, MICH.

Pick all your Hair and Moss



Hair Picker

AUTO FABRICS

BRAZIL LEATHER

FOR

TOPS AND CURTAINS

Welts
Tacks
Nails

Buttons
Webbings
Moss

Hair
Cotton
Wood Wool

G. H. LOUNSBERY & SONS, CINCINNATI, OHIO

Mention The Hub



LOUNSBURY BUTTON MACHINE
Makes Buttons, Tacks and
Clinch Buttons

Please mention "The Hub" when you write.

EDWIN GODDARD, President.

E. A. DUNBAR, Vice-President.

H. M. KUNKLE, Secretary and Treasurer

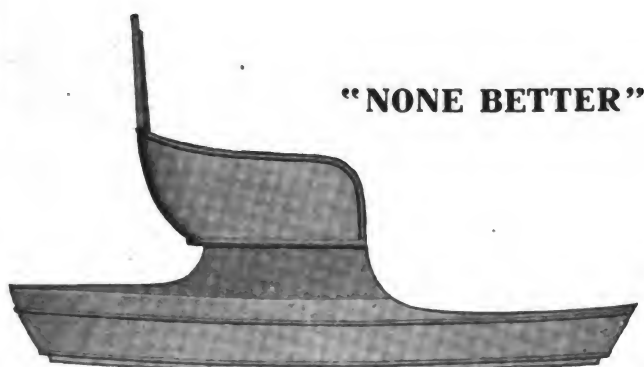
RASER TANNING COMPANY, ASHTABULA, OHIO

Manufacturers of

Automobile Enamel Carriage and Furniture Leathers

Do You Use

"EXCELSIOR" SEATS and BODIES



"EXCELSIOR" Concord Body No. 48

THE EXCELSIOR SEAT CO.

Write for Catalog.

COLUMBUS, OHIO

"BLACK VELVET" CUSHION SPRINGS

Manufactured Only by the

NATIONAL SPRING AND WIRE COMPANY
ALBION, MICH. WINDSOR, ONT.

THE SPRING OF QUALITY.



SPRING or SOFT EDGE CUSHION FRAME
For Buggies or Other Vehicles. Built of the Highest
Grade of Steel Wire.



STRIP FOR WOOD OR BOX FRAME

UNITED STATES WOODWORKING CO.

Successors to

BUFFALO AUTO BODY AND TRIMMING CO.

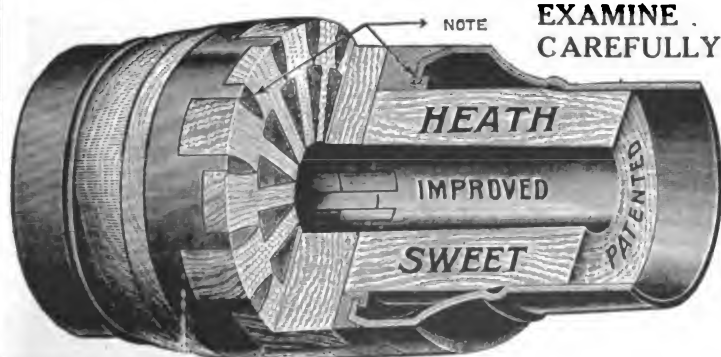
Manufacturers of

AUTOMOBILE, CARRIAGE AND WAGON TOPS AND TRIMMINGS
BUFFALO NEW YORK

Every Vehicle Dealer Should Read

The Hub

\$2.00 a year. Trade News Pub. Co., New York, N.Y.



NOTE

EXAMINE CAREFULLY

HEATH HUB

You Won't a Find Flaw

Manufacture also

SWEET SARVEN

KENNEY SHELL

WARNER OOD

and

Automobile Wheels

SHORTSVILLE WHEEL CO.,

Shortsville, New York

Please ment on "The Hub" when you write.

THE SURPRISE IS YOURS

When You Open Your First Can of
MOORE VARNISH

Easy Working Perfect Flowing Long Lived
Highest Quality Under Every Label

BENJAMIN MOORE & COMPANY

Varnish Makers

New York Chicago Cleveland Toronto

QUALITY, STYLE, DURABILITY AND QUICK
DELIVERY

THE EDWARD STINSON MFG. CO.
VEHICLE WHEELS

327-335 North Street - - - BALTIMORE, MD.

OHIO SEAT COMPANY

CARRIAGE AND AUTO WOOD WORK

Seats of Every Description, Canopy and
Cushion Frames, Buggy High Backs.

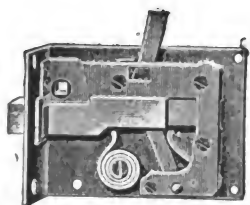
1964-66 CENTRAL AVENUE, CINCINNATI, OHIO

Special Carriage Trimmers Paste

GUARANTEED VERMIN PROOF

Will Keep in Any Climate. Ask for Price on No. 38.
Mention The Hub.

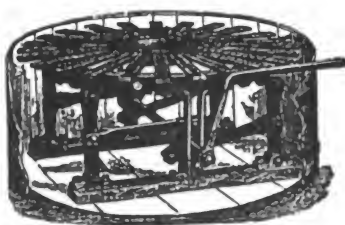
BUCKEYE PASTE CO., - COLUMBUS, OHIO



A. OCHSNER & SONS CO.

1061 STATE STREET
NEW HAVEN, CONN.

Auto and Carriage Locks, Hinges,
Fixtures, Etc., and Body-
makers' Tools.



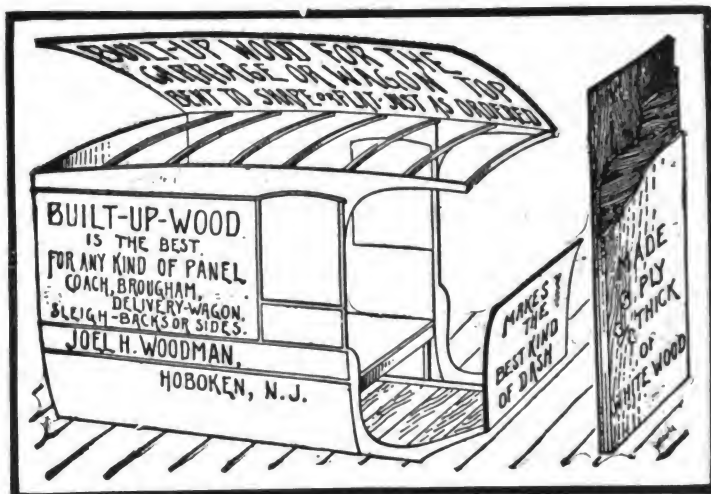
The Bokop Tire Setter and Cooler
Is the Best and Only Machine
that has stood the test during
the last 12 years on all classes of
work, and is the Only Machine
built with the indestructible
Wrought Iron Face Plate.
Over 1,000 are in successful op-
eration, repairs on which have
not exceeded \$6.00 in the last 12
years. For prices, references and
descriptive circulars, address
BOKOP, WEBB & PALM,
Jefiance, Ohio

Richard Eccles Co., Auburn N. Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile, Special

Send for Catalogue.



KEYSTONE BLACK FILLER

MAKES A PERFECT

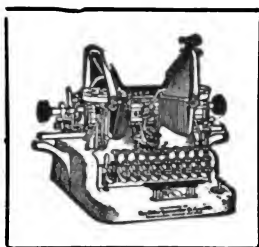
ROUGHSTUFF

For Automobile Bodies and Parts

It fills the pores of Metal and Wood perfectly. Sand-
papers easily and produces a fine, smooth surface
that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.



17 Cents a Day Buys

The

OLIVER

Typewriter

The Standard Visible Writer

Can you spend 17 cents a day to better advantage than in the purchase of this wonderful machine?

THE OLIVER TYPEWRITER CO.
310 Broadway, NEW YORK, N. Y.

HOTEL LATHAM

5TH AV. AND 28TH ST.

NEW YORK

For Permanent and Transient Guests

One block from Madison Square Garden

EUROPEAN PLAN

Sample rooms for commercial men

Table d'Hote Luncheon, 50c

CLUB BREAKFAST, ALSO A LA CARTE

ROOMS WITH USE OF BATH, \$1.50 PER DAY

ROOMS WITH BATH, \$2. \$2.50 \$3. \$4. PER DAY

A. L. PRATT

MANAGING DIRECTOR

JOHN REILLY Inc.

Established 1865

MANUFACTURERS OF ALL GRADES OF

LEATHER

FOR THE

Carriage & Automobile Trade

PARTICULAR ATTENTION CALLED TO

OUR AUTO SPECIAL

FACTORIES.

Avenues C & D, Murray & Astor Streets.

NEWARK, N. J.

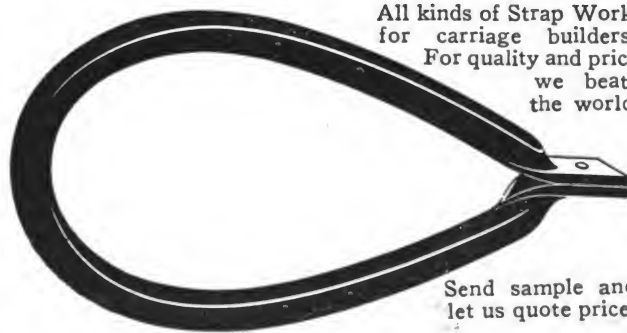
AGENTS,

Cincinnati—National Hardware Co., Fourth Street

Detroit—C. W. Findlater, No. 313 Forest Ave., West

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES

All kinds of Strap Work for carriage builders. For quality and price we beat the world.



Send sample and let us quote prices

J. C. DECKER :

Montgomery. Pa.

ESTABLISHED 1886.

Correspondence School of Carriage and Motor Carriage Drafting

A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

Principal, THOS. MATTISON,

Hillside Avenue, Bitterne Park, Southampton, England.

Author of "The Coach Body Makers' Guide," \$3.00; a practical treatise on "The Suspension of Carriages," "Bookkeeping," and other carriage building works.

HEADQUARTERS

For

Automobile, Carriage and Wagon Supplies

LARGEST WAREHOUSES IN PHILADELPHIA

Top Fabrics, Transparent Fibre, Brass Fittings, Forgings, Leather, Cloths, Carpets,
Wheels, Spokes, Felloes, Etc.

Let Us Show You the Goods, or Write Us for Attractive Prices

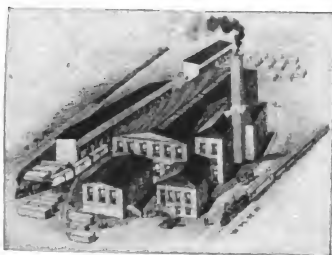
JACOB GERHAB

157-159 and 158-160-162-164 N. Third St.,
Philadelphia, Pa.

W. G. LEAS, Pres. & Treas. J. L. BOWER, Sec. & Mgr.

Eureka Bending & Wheel Co.

RIMS
BOWS
PLOW
HANDLES



GEAR-
WOOD
BENT
STOCK



YORK, PA.

Jones Wheels

BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.
Newark, N. J.

4-in-1

A Substantially-Built, All-
on-One-Arbor Combination

Jointer, Saw, Boring and Tenoning Machine

Not too many machines in one—just enough.
Made with either 8 or 12-inch jointer.

Get our complete catalog of handy tools.

BICKNELL MFG. & SUPPLY CO.
JANESVILLE, WIS.

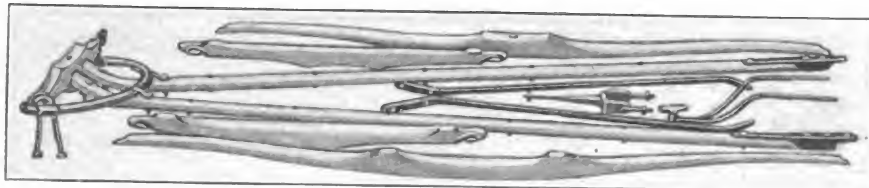
THE FAIRFIELD RUBBER COMPANY

Manufacturers of

Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.

FAIRFIELD,

CONNECTICUT



The Buckeye Handle Gear & Bending Co.

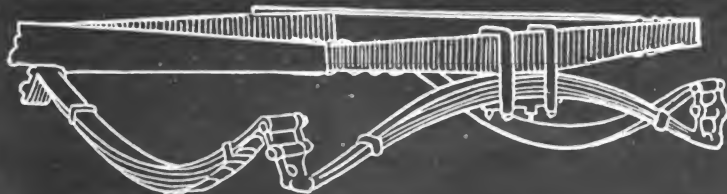
ALLIANCE, OHIO

Manufacturers of Gear Woods

OUR OLD RELIABLE GEAR SET

The Most Complete Set on the Market.

Write for Catalogue and Prices.



Automobile Wagon and Truck SPRINGS

KEYSTONE SPRING WORKS, Inc.

1301-11 Buttonwood Street

PHILADELPHIA, PA

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

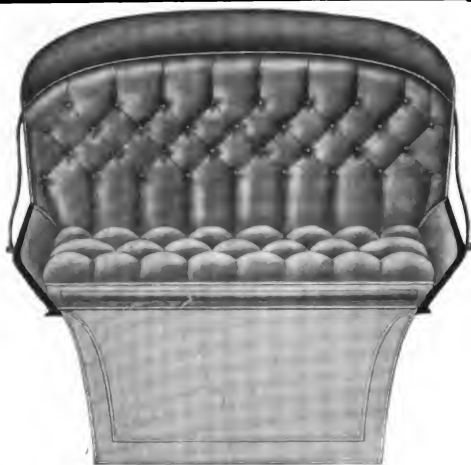
Manufacturers of

F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.



THE NOVELTY TUFTING MACHINE

is a device that meets any and all requirements in the upholstering of Cushions, Backs, and other parts where upholstering is required.

It takes up very little space; can be run by hand or power, as desired, and is so simple a boy can learn to operate it in an hour's time.

It is adapted to any grade of material or filler and we guarantee uniformity of design, using the smallest possible material allowance.

Ask for further particulars and our time-payment proposition.

NOVELTY TUFTING MACHINE COMPANY

1200 Michigan Avenue, CHICAGO, ILLINOIS



BOLTS Rivets, Carriage Makers' Washers
and Burrs for all kinds of Vehicles
Russell, Burdsall & Ward Bolt and Nut Co.

Main Works, PORT CHESTER, N. Y.

Branch at Rock Falls, Ill.

Time Has Told the Story!

Service and satisfaction always follow our rolling stock

WHEELS

ALL KINDS—BEST QUALITY

Also RIMS and SPOKES

The Eberly & Orris Mfg. Co.
MECHANICSBURG, PA.



McKINNON DASH COMPANY

BUFFALO, N. Y.



No. 263-N with Nickel Rail.

TROY, OHIO,
CINCINNATI, OHIO.

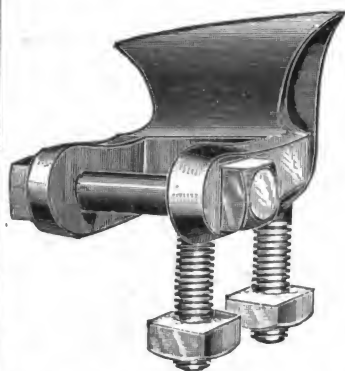
ST. CATHARINES,
ONTARIO.

ARE YOU IN LINE

With the Leaders for 1912?

THEY WILL USE DASH RAILS

Welded Solid To The Dash Frame



Skewed Shaft Couplings

Regular or Oval Patterns
For High Arched Axles

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



A. H. WIGGERS
Pres. and Mgr.

H. H. WIGGERS
Sec'y and Treas.

E. S. WIGGERS
Vice-Pres.

WIGGERS' BODIES

Automobile - Carriage

MERIT CONSIDERATION



Just One of Many Styles.

Because { THEY HAVE { Style
 { AND ARE { Quality
 { Symmetrical Outlines
 { Well Seasoned
 { Made to Wear
 { Priced Right

Address

The Wiggers Furniture Co.

Manufacturers of Carriage
and Auto Bodies and Seats

1417 to 1423 Plum St.

Cincinnati, Ohio

The Higgin

LINE OF CARRIAGE TRIMMINGS

KNOBS

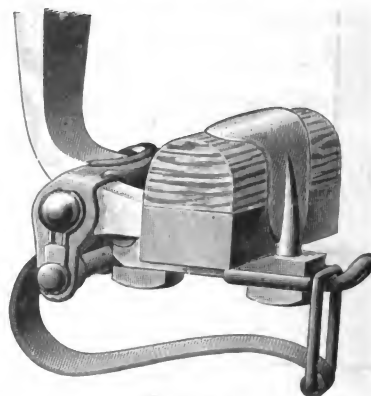
KNOBS



No. 70.



No. 133



(Closed.)
The Higgin Quick Shifter.



No. 72.

No. 130.



Full Leather Nut



No. 74.



Black Japan Nut

QUALITY UNSURPASSED.

Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co.

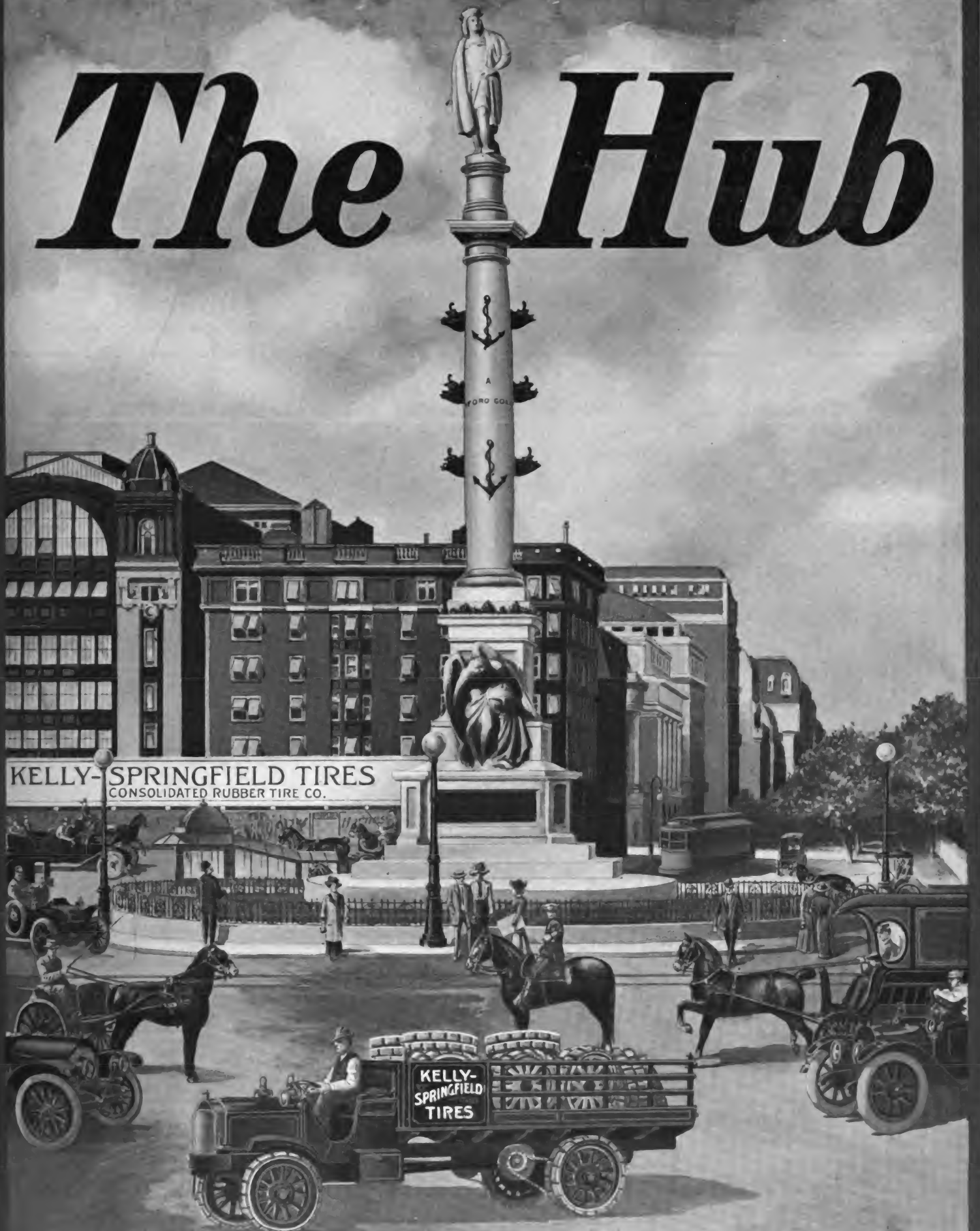
Newport, Ky.

The Best Varnish for Carriages
and Automobiles

HILDRETH VARNISH CO.

No. 90 WEST STREET
NEW YORK

The Hub



TRADE NEWS PUBLISHING COMPANY
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN

STAR or KENNY

Sweet Concealed Band

WOOD HUB

WARNER

WHEELS

HEAVY and LIGHT
for
CARRIAGES
WAGONS and
TRUCKS

IF YOU WANT THE BEST TRY OURS



Load—Ten Tons of Coal.

SOLVED!

Is the way motor car experts express themselves on the subject of tires for commercial motor vehicles after seeing and using the

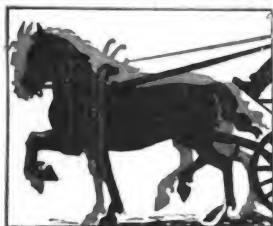
KELLY-SPRINGFIELD SECTIONAL TIRE

With a grip on the road that means progress and security from the fault of solid tires—that of crowding the rubber ahead under load, which means disintegration—the motor wagon and truck owner will find in the Kelly-Springfield Sectional Tire the best tire for all heavy cars. Each section is dependent upon itself. If interested, write

CONSOLIDATED RUBBER TIRE COMPANY

New York, N. Y., and Akron, Ohio

Branches: Boston, Chicago, Philadelphia, St. Louis, Detroit, Cincinnati, San Francisco.



A LIGHT horse can do the work of a HEAVY one!

These facts mean more PROFIT for YOU.



ONE horse can do the work of TWO, and TWO the work of FOUR.

When You Push

TIMKEN ROLLER BEARING AXLES

you are adding directly to your profits and making and holding a bigger and better wagon business.

Ask for Catalog and Price Lists.

TIMKEN ROLLER BEARING COMPANY
Canton, Ohio

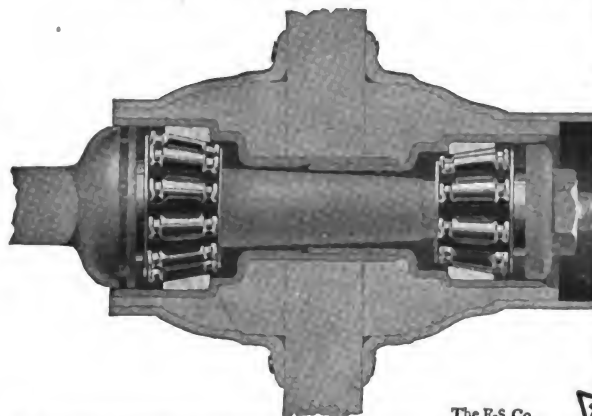
BRANCHES- 65th St. & B'way, New York - 1347 So. Michigan Av., Chicago

TIMKEN ROLLER BEARING AXLES

make a wagon easier to sell and make your profit on it greater. Any sensible wagon buyers wants a wagon (even at a little higher price) that has 50% less draft.

Requires oiling only once a month. Cuts Feed, Shoeing and Harness Bill in Two.

GUARANTEED FOR TWO YEARS



The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Please mention "The Hub" when you write.

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York, Chicago, Minneapolis, Kansas City

F. O. PIERCE COMPANY

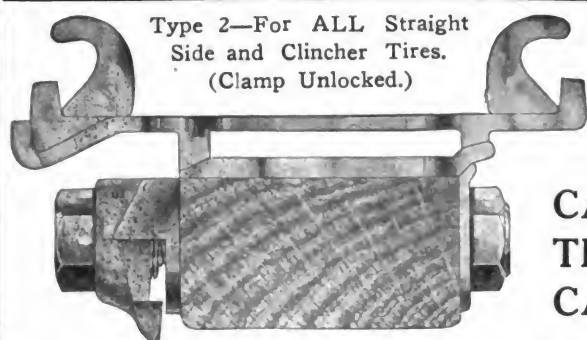
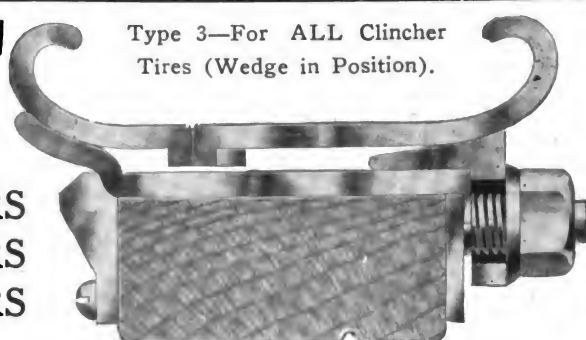
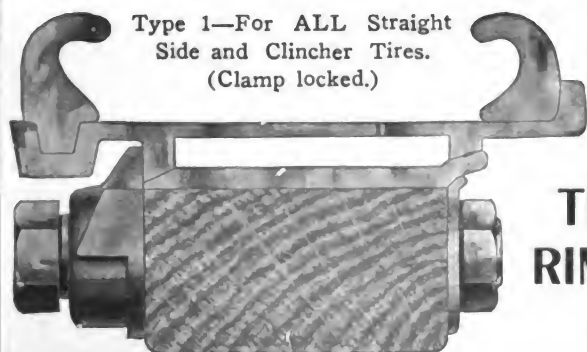
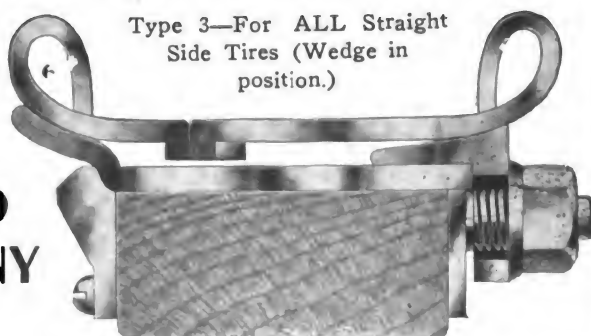
NEW YORK, U. S. A.

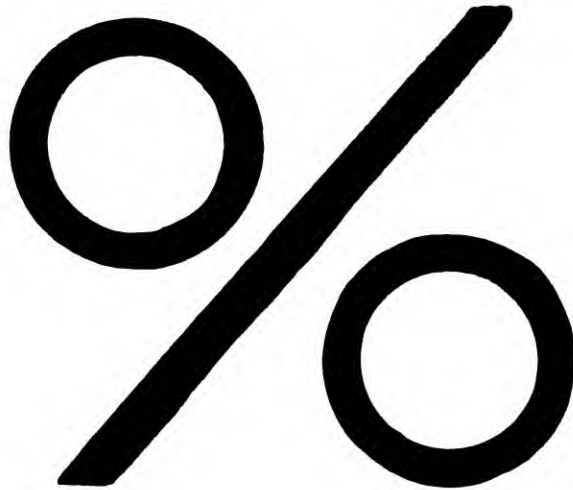
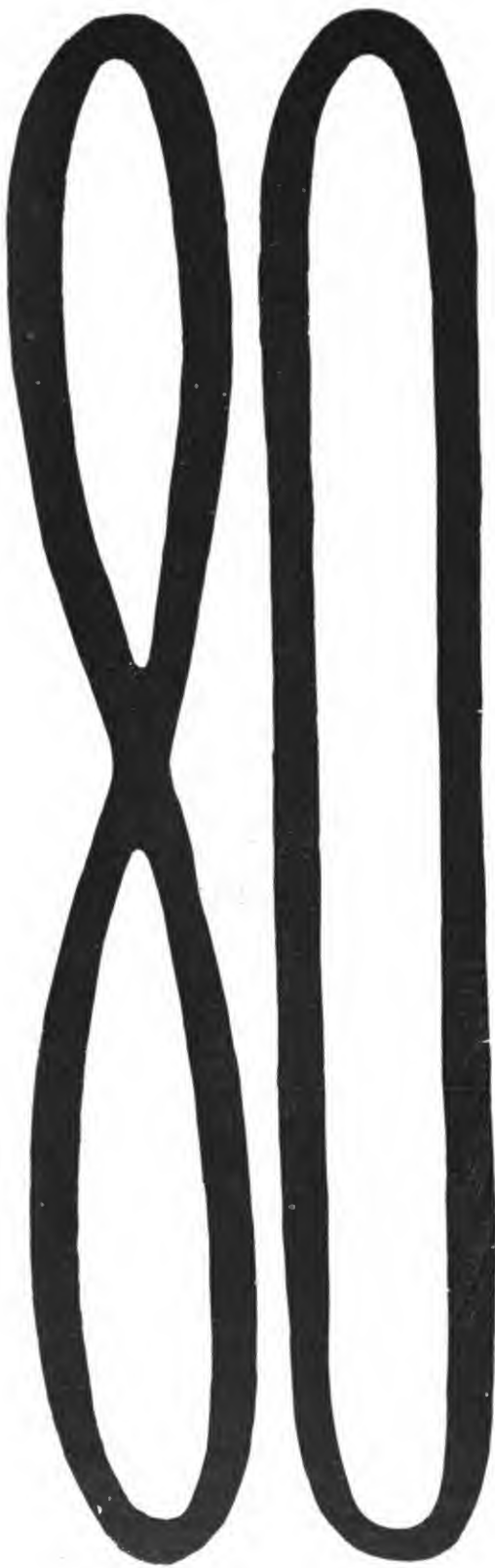
Manufacturer of High Class Pigment Colors
from ORIGINAL FORMULAE. Colors ground in
Japan and other MEDIUMS to meet any
SYSTEM of APPLICATION

Our Latest Production UZATONA EXTRA LIGHT for Automobile Painting

Our Automobile Color Book just issued showing latest shades for this class of work
mailed upon application.

Please mention "The Hub" when you write.

MOLLER & SCHUMANN COMPANY**COLORED RUBBING****Most perfect as to working, drying and wearing.****CARRIAGE & AUTO VARNISHES****Send for color card and descriptive price list.****Office and Factory - BROOKLYN, N. Y. Chicago Branch - 110 N. Desplaines St.,
San Francisco Branch - 1022-1024 Mission St.****THE FAIRFIELD RUBBER COMPANY****Manufacturers of****Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.****FAIRFIELD,****CONNECTICUT****THE SURPRISE IS YOURS****When You Open Your First Can of****MOORE VARNISH****Easy Working Perfect Flowing Long Lived
Highest Quality Under Every Label****BENJAMIN MOORE & COMPANY****Varnish Makers****New York****Chicago****Cleveland****Toronto****STANDARDIZATION
OF RIMS THAT
BENEFITS****CAR BUILDERS
TIRE MAKERS
CAR OWNERS****The Standard Universal Quick-Detachable Demountable Rims****"FIT ALL TIRES" and SOLVE THE PROBLEM OF INTERCHANGEABILITY****25,000 Sets of Demountable Rims and 135,000 Sets of Quick Detachable Rims; practically 96% of the total number of Rims made in the United States, have been contracted for by 100 leading manufacturers.****Write for illustrated
descriptive matter.****THE UNITED
RIM COMPANY
AKRON, OHIO****Please mention "The Hub" when you write.**



We sell finishing materials to **80 per cent** of the carriage and automobile trade in the country.

This wonderful percentage is based solely on

QUALITY

The minute any other varnish manufacturer offers varnishes as good as Valentine's he can have his share of the business.

Any interested user of varnish is entitled to call on us for proof of this statement. Here for instance is one proof:

If you had to get up a list of the best carriage and automobile trade in the country you couldn't select a more representative list than that in *The Hub 1912 Style Portfolio*, could you? (See September issue of *The Hub*.)

More than 80 per cent. of the manufacturers on this list are customers of ours.

Note that some of the concerns on this list make the highest priced carriages and automobiles in the world, and that others are noted the world over for their low-priced carriages.

We furnish varnishes and colors to both.

You will be interested, we are sure, in our Vanadium Varnish Book which tells about varnish good enough for \$8,000 motor cars, and economical enough for \$20.00 buggies.

Mail coupon for Vanadium Varnish Book.

Valentine & Company

257 Broadway, New York.

Chicago

Boston

Toronto

Paris

Amsterdam

TRADE **VALENTINE'S** MARK
VARNISHES

V.V.B.

Name.....

Address.....

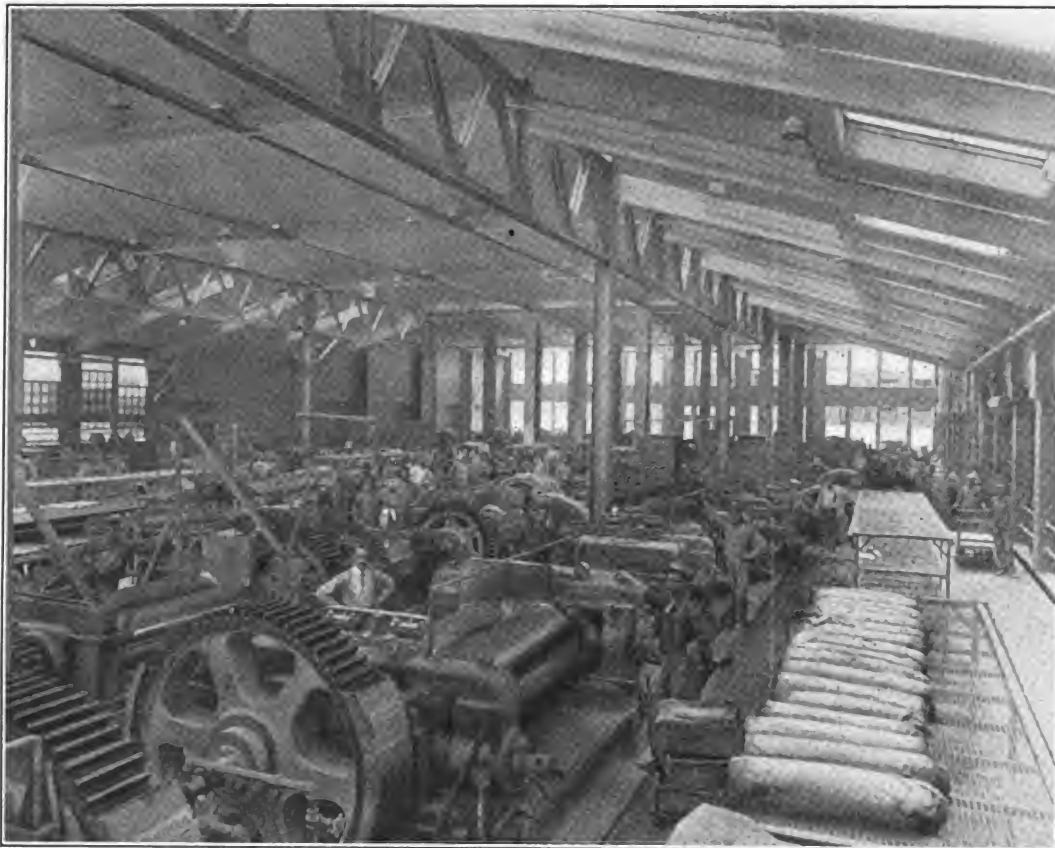
Town.....

State.....

Cut out & mail to
Valentine &
Company

GOODRICH "SERVICE"

The Mill Room



Here the rubber is rolled or milled to give it proper consistency. This is the next step after the cleaning and drying of the crude. In other words, this picture shows the manufacture of rubber. Further on, the rubber is patterned into articles of sale, and cured.

This Department, representative of the equipment of the plant of the B. F. Goodrich Company, is the largest and most completely equipped Mill Room in the world.

The B. F. Goodrich Company

Akron, Ohio.

HAMILTON-OHIO-LINE, WOOD-WORKING TOOLS

For Carriage, Wagon, Hub, Spoke, Rim, Wheel and Body Work

Disk Sanders, Belt Sanders, Spoke Sanders, Wheel Sanders, Gear Shapers, Scroll-Eyeing Machines, Gear Rounders, Spring-Bar Boring Machines, Seat-Back Benders, Rim Planers, Rim Rounders, Rim Boreers, Rim Cut-Off Machines, Wheel Boring and Screw Driving Machines, Spoke Lathes, Spoke Cut-Off Saws, Spoke Tenoning and Mitering Machines, Spoke Throaters, Spoke Facers, Wheel Facers, Wheel Tenoners, Hub Lathes, Hub Mortisers, Hub Boreers, Wheel Boxers, Wheel Presses, Tire Truers, Tire Bolters, Spoke Cut-Off Machines, Band Saws, Rip and Cross-Cut Saws, Planers, Matchers, Moulders, Shapers, Boring Machines, Universal Wood Workers, etc.

THE BENTEL & MARGEDANT CO. HAMILTON, OHIO, U.S.A.

We Offer In

PROTEKTOL

The Ideal Paint Vehicle

PROTEKTOL is the result of careful study and scientific research for a carrier to produce a perfect paint film.

Paints made with PROTEKTOL as the vehicle, look better, wear better and last longer than any other paints now produced. They flow perfectly and dry to a smooth, elastic film, free from the pores so objectionable in linseed oil paints.

The inherent drying property of PROTEKTOL obviates the necessity of adding driers for outside work.

Convince yourself of the merits of PROTEKTOL by giving it a practical trial.

The use of PROTEKTOL means Perfect Paints as well as money in your pocket.

Write to-day for descriptive pamphlet.

70 Cents per Gallon.

Branches:

New York, Philadelphia
Buffalo, Toronto
Montreal, Buenos Aires

THE AULT & WIBORG CO.
VARNISH WORKS
CINCINNATI.

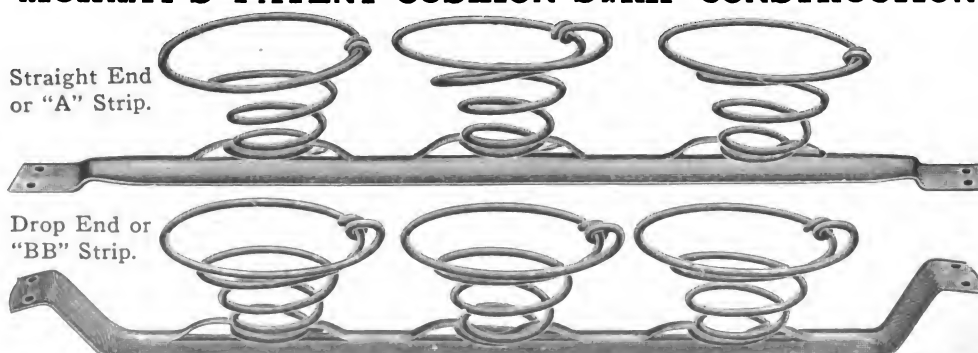
Branches:

Chicago, St. Louis.
Minneapolis, San Francisco
Mexico City, London, Eng.

MURRAY'S PATENT CUSHION STRIP CONSTRUCTION

We sell 90% of the carriage trade 15,000,000 sold in the last ten years. That is going some.

The reason—
Price—Quality—
Quick Shipments.



We can take care of a few more contracts but you must hurry. We also manufacture special auto constructions. Write for details. Are you a customer?

MANUFACTURED BY THE WM. A. MURRAY SPRING CO., CINCINNATI, OHIO

Please mention "The Hub" when you write.

The

Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

OCTOBER, 1911.

No. 7.

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, *President.*

G. A. TANNER, *Secretary and Treasurer.*

24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00

AMERICAN HARNESS AND SADDLERY

DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Features of the C. B. N. A. Convention.

More than eleven hundred interested in vehicle affairs attended the convention in Atlantic City. Blessed with the good fortune that seems an abiding asset of the association, the weather as a whole was perfect. The one unpleasant day occurred on Friday immediately following adjournment, but that day was an object lesson as to what the elements can do when they set out to be nasty. Had the rain and wind demonstrated on the previous day, the vote to return to Atlantic City in 1912 would probably not have carried.

A summer-resort convention was something different for carriage makers. Young's pier, where the exhibition of vehicle parts was shown, was ideal as a warm-weather, dustless show ground. The space occupied was gaily decorated, and to cap sheaf all a pretty building in imitation of a Greek temple, also on the pier, was a comfortable meeting room for the daily business sessions of the association.

The business was somewhat devoid of interest, however. There were three contributed papers read, which we feature in our report, but aside from these there was

nothing to jar the routine of committee reports, which failed to call out discussion, but which met with warm approval.

There was a very strongly expressed sentiment in favor of the convention meeting in Richmond next year, but it failed to materialize at voting time.

The voting, by the way, was a very irregular, tumultuous proceeding, entirely out of order with by-laws governing such procedure, as plainly announced by the secretary before the vote on next place of meeting was taken. The tellers were stampeded and helpless, it seemed, and some, perhaps many, voted on this occasion who were not privileged to do so. The presentation of the cities, always an interesting performance, was applause provoking when Mr. Dabney spoke for Richmond. This clever lawyer made an address that took his hearers off their feet. St. Louis was also strongly and well presented, and as the delegation from the West came as boomers and boosters, and had enlisted the sympathetic support of Cincinnati, it seemed at one time in the week that it was all over in favor of St. Louis. Perhaps if the vote had been regular it would have so turned out.

* * *

As usual the Accessory trade association held its meeting during the convention week, and the printed report details its proceedings. The contributing feature of this organization makes of every contributing accessory firm a member. The contribution, be it understood, is an entertainment fund with refund attachments, that helps out the C. B. N. A., and otherwise adds to the gaiety of life convention week. The function of the meeting appears to be to only elect officers when two or more are gathered together, hence out of the hundred or more who are members in attendance, it is comical to see the six or seven devoted souls who meet and transact the business of the organization. This year even its president failed to preside owing to indisposition.

The traveling men known as C. H. A. T. were much more enthusiastic in their ceremonial, both as to spirit and number, and their little "banquet," which was really an admirably served fish dinner at the Inlet, (a show spot of Atlantic City) was one of the jolliest functions of the week.

* * *

Carriage builders are very hospitable. They always have something nice prepared for their guests in which they join. The usual Tuesday evening reception which starts the festivities was engagingly staged in the most decorative part of the Marlborough-Blenheim hotel, the

association headquarters, and some two hundred ladies and gentlemen enjoyed conversation, music, dancing and a splendid collation until a late hour in the evening.

The official banquet was a brilliant affair, not as largely attended as is customary, perhaps, but having lots of quality. The service and appointments were most satisfactory and a credit to the Marlborough-Blenheim. The speakers were prominent men and the speaking in accord with their fame. Hon. Leslie M. Shaw was the headliner and his subject and manner held his audience in interested thrall. While his subject was politico-business, it applied closely to the interests of his hearers and his points were keenly appreciated.

The anti-climax was reserved to the last speaker, the Rev. W. Warren Giles, a most clever, humorous and trenchant speaker, never exceeding the limits of propriety looked for from wearers of the "cloth," yet so well within the spirit of the occasion that nothing preachy was solemnly injected into a festive treat. He handled some of the sophistries of the learned ex-Secretary of the Treasury so very ingeniously, but with an admixture of so much honey of speech, that even the man criticised enjoyed the points made. The association has always been very happy in the choice of its reverend guests. They have often been the star performers at the banquets.

Mr. Homer McDaniel, the secretary of the Associate association, is said to be a great ladies' man, in that he has a profound admiration for the sex, and often testifies to it in graceful fashion, so this year he organized a subsidiary banquet in behalf of the fair ones to be enjoyed on the same evening as the official feast, the room so arranged that the ladies at dinner could keep their eyes on the men folk, and mingle with them when the intellectual exercises of the evening began. We are not so sure after the event that the courteous secretary really knows what ladies like best; as a more solemn, speechless, bored hundred women eating together we have never before seen. If this function had been an evening on the Steel Pier, as had been proposed, with music, dancing and jollity, and plenty of men mixed in as leven, we are sure he would have scored better in the opinion of the gentler sex. Perhaps after all, McDaniel knows more about leather than ladies.

This about epitomizes the doings of a happy, enjoyable week, and if it is duplicated next year with some improvements suggested by past performances, it will be all that could be wished for.

The Hard Wood Propaganda.

An illuminating example of the persistence of an idea and its results is now being testified to by the hardwood interests, that is, those who have such stock for sale, through the medium of the Hardwood Record, acting as a press agent and bureau of publicity.

We judge the lumber interests are being touched on the pocket nerve sensitively or such a campaign would not be undertaken. It is expensive.

We advert to the matter more to show what an idea perpetually exploited for a long time will do when the

momentum of the thought really gets going at speed.

For many years in the vehicle trade the one perennial topic has been the "scarcity of the hickory supply." The Carriage Builders' Association has featured it in papers read before its assemblies. The hewers of such wood have preached an almost "holy war" against the wanton destruction of such stock. There has been organized a very special association whose sole business was to preach conservation of such supplies. The hardwood experts have gone into statistics to the point of predicting the number of years (not many) when we would have no more hickory suitable for vehicle uses. The government has organized a special department to lend a helping hand. Most naturally all this agitation is bearing its appointed fruit. We find metal construction by the railroads supplanting wood. It began with the freight service and has now overflowed into the passenger car domain. We find the metal body and metal wheel becoming familiar objects in carriage shops.

Everyone looked with hopefulness on these developments as being a harbinger of better times when we would have enough hardwood remaining at least for toothpicks.

Those who sell hardwood are feeling the pressure, and are now at work to show how absurd all this hue and cry has been. They have plenty for sale—at a price, and as the campaign progresses we will be informed, probably, that it is unpatriotic as well as not economic to use metal despite important interests whose living depends on denuding the forests.

What are the laity to think when the doctors disagree? Who will decide?

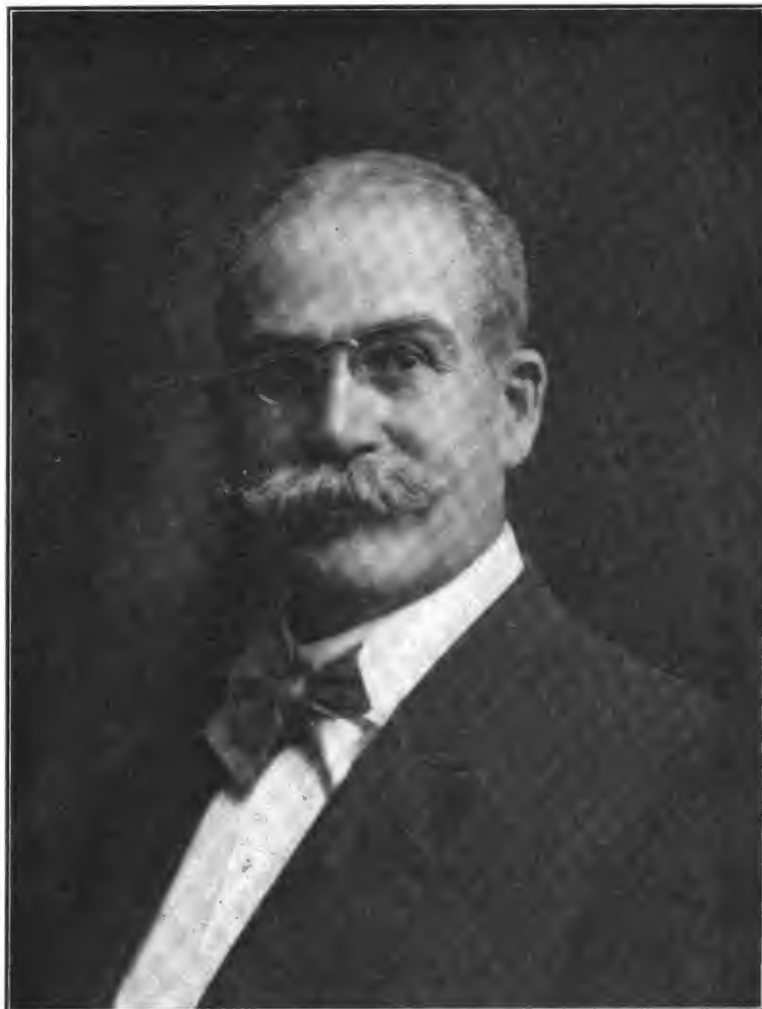
As this is a land of special interests and we all want to help each interest get rich in a reasonable short space, regardless of time or eternity, it becomes hard to know what our duty is as between the steel trust and the lumber trust, if a decision must be made. We want them both to have all the ready money in sight, so we want to buy from both. The only compromise seems to us to be a composite one; and let posterity lookout for its own troubles.

The Passing of the Horse. (?)

Mr. Reeves, who is looked up to as an authority in automobilia, has given out the statement that 190,000 cars has been the output for the last twelve months. This is fine.

Let us see. In St. Louis the season's output of the lowly, unpretending buggy hauled by the almost extinct horse was about 125,000 jobs. Over in Indiana in one little town a modest buggy builder completed and sold 65,000 jobs. Cincinnati doesn't have time to tell about it, but a small bunch of factories "in its midst" was responsible for more than 150,000 more. We will not consider Michigan, as that is sacred automobile ground, but a modest factory up in Flint thinks Dame Fortune is not kind if she reduces a 35,000 output by a single thousand.

If the modest buggy was exploited to the extent of the gas buggy, and made a third as much noise, people would really be thinking the auto supply was running short.



W. H. McCURDY
President Carriage Builders' National Association.

PRESIDENT McCURDY MAKES TIMELY APPEAL

To the Members of the Carriage Builders' National Convention:

Having been elected president of the Carriage Builders' National Association at the last annual meeting held by that organization in Atlantic City, September, 1911, I take this opportunity to address the membership of this honored institution. It is my desire to become as useful to this association as opportunity and time will permit. I am writing this letter in the hopes that all of the members who attended the last convention as well as those members who were prevented from attending, will read it and assist me by giving their views on the few points which I am presenting. I am positive that a membership in the C. B. N. A. is of benefit to the carriage manufacturer, whether he be a large or small builder. Can we not make this organization of greater value to each and every member? I would like to ask these few questions: What is the best plan to adopt to insure an increased membership during the coming year? What can we do to make our regular convention meetings more interesting? What would you suggest being done to bring every one into attendance at these meetings? Have you any suggestions as to the exhibits, can they be made more useful; can anything be added to the attractiveness, arrangement, display, management? Has the policy of admittance to the exhibits been a success? Are you in favor of the plans of excluding those not members from the exhibit hall—in others words can the exhibits be improved upon? In what way can we add to the pleasure and enjoyment of the annual occasion, what would be the best manner of entertaining the ladies? Please understand me that as far as I am concerned the conduct of the exhibits, meetings, plans for entertainment and all those interesting features have been most admirably conducted in the past, my desire is to know the feelings of the membership and if possible enhance the value and increase the benefits of this organization. I therefore ask of you to favor me with your opinions on the above matters and any others that may suggest themselves to you. With this co-operation on your part I will be in a better position to execute the will of the membership of the association.

Yours very truly,

W. H. McCURDY,

President.

Evansville, Ind., October 15, 1911.

CONVENTION BY THE SEA

C. B. N. A. Meeting at Atlantic City Such a Success That it Will be Held There Again in 1912. W. H. McCurdy Elected President.

FIRST DAY'S PROCEEDINGS.

Tuesday, September 26.

The meeting was held in the Greek Temple on Young's Million Dollar Pier.

In opening the proceedings President Richter introduced Hon. Harry Wootton, city solicitor of Atlantic City, who made a pleasing address of the usual "welcome to our city" brand, and was cordially received.

A. T. Bell, chairman of the Convention Committee of the Hotel Association of Atlantic City, on behalf of the hotels, presented their compliments and best wishes for the success of the gathering. Mr. C. C. Hull, of Connersville, Ind., responded as follows:

RESPONSE TO THE WELCOME ADDRESS.

CHARLES C. HULL: It affords me extreme pleasure to accept on behalf of the membership of our association and its friends here assembled this very generous welcome accorded us by the world's greatest pleasure city through her representative, the Honorable Harry Wootton.

It has been stated that this is the thirty-ninth anniversary of our association. The purpose of this association has been and is still the promotion of the interests of the carriage manufacturers and their allied interests. These are some features about our association which I believe it might be of interest to those who represent Atlantic City to know about.

One of the features that I will mention of is this, that in all these thirty-nine years the manufacturers have not gotten so close together that the national government believes that it is necessary to ask for dissolution. (Laughter.) The other feature about our industry is this, that we have never committed a crime against good morals (Laughter) and I question if it will be necessary during our stay here for us to know more than in a social way of your authorities. (Laughter.)

We are very grateful I assure you for the very kind and encouraging words which you have given us in regard to the future of our industry. Those of us here I think will voice the sentiments of Mr. Bell that the carriage and horse will be here after the flying machine and the automobile are better known than they are to-day.

You cannot make us believe—we people who earn our daily bread by the sweat of our brows making buggies—that the horse and carriage is going to be relegated to the rear even though we have some pessimistic friends and occasionally a man who has gotten so low in spirits as to say that he believes that the day will finally come. We believe the horse and carriage are here to stay. Most of us here, I am sure, have had a fairly successful year in the building of carriages. This is about as satisfactory as can be said of those representing any other industry to-day. The business of this country has been just slightly below normal throughout the entire year, but the carriage industry making a staple commodity I believe to-day can show as good a record as to profit earning as the average manufacturer of a staple commodity so we come here not to bewail our condition but we are here to say that we believe we can compete with the automobile and the flying machine in the future as we have in the recent past.

I sometimes wonder how it is a few manufacturers can be content after a year of hard work—because we do work hard—to stay away from our annual conventions because it is so

necessary to know what the Accessory man has done throughout the year for the benefit of the carriage industry and I speak this sincerely because I do not believe there is any carriage manufacturer who does not appreciate what these conventions really are, what these exhibits really are, and the necessity of the carriage builder being up-to-date and knowing what is being produced.

President Richter then read the president's annual report which follows:

ADDRESS OF PRESIDENT RICHTER.

The thirty-ninth annual convention of our association assembles this year at Atlantic City under somewhat different conditions than have obtained heretofore, as our meeting occurs at a famous pleasure resort on the Atlantic Ocean with every facility to spend an agreeable vacation.

Our faithful and painstaking secretary, Mr. Henry C. McLearn, has been engaged for months to place every comfort and pleasure within the reach of our membership which I hope will insure a large and interested gathering at our meetings.

From a modest beginning in 1872, we have become one of the oldest and most influential trade organizations in the country standing for the highest ideals in our craft and diffusing useful information on all important subjects, inculcating sound business principles among the members of our organization. We have always endeavored to accomplish this without any attempt at interference with the perfect freedom of the business of our members or with the least effort to pecuniary gain, or to make any combination, or to do anything which in many well known enterprises have been before the public eyes as "In Restraint of Trade."

It should be a source of great pride and gratification to our various Executive Committees that their interest of many years standing in good roads, conservation of our resources and the tariff commission have risen to the importance of national questions and are now in process of successful adjustment to the great benefit of our membership and all the people of the country. I have no doubt that we can claim a share of the credit of awakening an intelligent public opinion on these important questions which concern so vitally the entire nation.

I desire to call attention to the very important work of our various committees, whose labors have been of the greatest benefit to our organization.

The Committee on Freights and Classification have revolutionized the crating and packing of our products. These very important matters have been standardized throughout our trade and through them and the proper classification of the freight rates, millions of dollars have been saved. This has been accomplished by the committee, by perfectly fair negotiations with the transportation companies according to just and honorable business principles.

Committee on Fire Insurance.

My predecessor, Mr. McIntyre, called attention at some length in his message last year to the important subject in the hands of the committee and the great saving which will accrue by a proper observance of the suggestions made from time to time. This work has cost a great deal of effort and thought and many of the suggestions can be carried out at very small initial cost and little labor. This will be returned in reduced insurance cost besides adding to the efficiency of a plant, improving

order and cleanliness which is bound in turn to favorably effect quality and finish of production.

The Technical School.

This school now and for many years in successful operation has accomplished a great work in educating deserving young men in the technical requirements of our trade, qualifying them to be better mechanics and putting them in line for higher positions as helpers in the conduct of our businesses. A day, and evening, and a correspondence class is maintained, to which tuition is entirely free except in the case of the latter, where a small fee to cover the cost of postage, etc., is charged. The pupils are almost entirely young men who work at the bench, who attend the evening classes and the guiding principle of the school is to train them as working men to think as well as to do things.

There is no object among our numerous activities that appeals stronger to your continued support than this Technical School to which I earnestly recommend it. You have honored me by making me the chairman of the committee having this school in charge, and it is only proper and just for me to add, that through the fidelity, wisdom and intelligence of my predecessors in this office, the school owes its high character and efficiency.

Committee on Credits and Costs.

These subjects are of the most vital importance to the trade, and their correct adjustment is the foundation of the success of our business enterprise, and I would therefore solicit careful consideration to the reports made under these heads.

Perhaps this will be a proper place to call attention to the grave abuses that have grown up under the interpretation of our official guarantee. When this was first established, almost, I believe, coincident with the foundation of the association, it was considered a just and equitable agreement between the manufacturer and buyer, but as the years have gone, abuses have grown up which have made for a condition that is a great hardship for the manufacturer, and I therefore recommend that the subject be taken into serious consideration to the end that some plan may be evolved to correct these evils.

Good Roads.

When our executive committee of that time started the work in behalf of this very important subject, they made our watchword that Good Roads Lead to Prosperity. This is not only true of our business but of all the concerns of an entire community by affording safe and comfortable means of intercommunication between the habitations of its people and their condition shows their degree of enlightenment and progress. Our committees having this work in hand have always shown commendable interest and have stimulated public opinion insuring the progress that is constantly made throughout the country. I hope that our efforts in this direction will be continued with unabated zeal.

Membership.

Our membership should be increased to include every carriage maker in the country, no matter how small his business may be. The moderate annual fee will be more than repaid by the very valuable information on practical and commercial lines which we furnish, our influence as an Association being increased by a large membership.

The Future of the Carriage.

Although the carriage has been superceded by the horseless vehicle in the large and opulent centers of population, many of those who are still in the carriage business in the sections referred to, report that they are having a growing demand for the horse-drawn carriage, and that for some purposes some styles are steadily demanded. This demand being slowly increased as the great number of carriages which came upon the market when the horseless vehicle came into use are absorbed, and by reason of the fact that some customers have returned to horses, while others have decided to use vehicles with both kinds of propulsion.

While it is probably true that the horse-drawn carriage has been largely superceded in the sections referred to, the light horse-drawn pleasure carriage will always have its place and use; its field is almost the entire country and its clientele the largest part of our large and growing population.

Export Trade.

My attention has been called to the possibilities of the export trade for our manufacturers, which would seem to offer great inducements for large and valuable expansion of our products. The government, through the Department of Commerce and Labor, is issuing very valuable information on this subject to which I would invite the attention of such of our members who desire to cultivate what would appear to be a very attractive and profitable field. My own study of the subject leads me to suggest the wisdom of carefully studying the country to be exploited, the habits of its people and their



HENRY McLEAR,

Secretary, Carriage Builders' National Association.

methods of doing business, and by all means to send a representative who is familiar with the language of the people. All these views are borne out by the experience of our German friends, whose wonderful trade expansion all over the globe is universally acknowledged. It would seem that our trade with its enterprise, splendid production and attractive prices should share the benefits of a field that has only been scratched on the surface.

The Business Outlook.

Business in some sections of the country has been prosperous, although as a whole, I believe that progress has faltered, due, doubtless, to over-expansion and the confusion and distrust resulting from the ensuing panic of 1907.

But with bountiful crops since that time, abundant money and a credit that is not surpassed by any other nation of the world, surplus stocks in all lines of business reduced to the lowest point, conditions are slowly and steadily improving. The crops this year may be short here and there, but in view of our great variety of products and our larger acreage, they will doubtless turn out a good average as a whole.

I now declare the thirty-ninth annual convention open for business.

The President called for the report of the Executive Commit-

tee, which was read by Mr. Charles Lancaster, chairman, as follows:

REPORT OF EXECUTIVE COMMITTEE.

The association is now completing its thirty-ninth year, and I trust its members are deriving more benefits from their membership than ever in the past. The Executive Committee, Freight and Classification Committee, Committee on New Members, and many others have been doing important work the past year and many good results have been obtained which have been beneficial to every manufacturer of vehicles. I cannot help feeling the importance of the several committees and their work during the entire year is not fully appreciated.

Early in the year the Freight and Classification Committee mailed a circular letter to the carriage trade giving some idea of what this committee was doing, and I hope this letter met with general approval.

I have mentioned these things in a brief manner to illustrate the real business value of the association to its members and with the annual exhibit of Accessory parts at our convention, the importance of membership in the association cannot be too strongly emphasized.

At the last meeting of the Executive Committee much time was spent in arranging a plan to secure new members, and finally it was decided to send printed lists of all carriage builders not members of the association, who attended the convention at Cincinnati, to members of the Executive Committee, who were to communicate with these non-members and if possible secure their membership.

My attention has been called this year to special reduced rates offered by the railroads to associations who pay very little or nothing for freight on their product, and it does seem to me that an Association like ours, whose members are continually paying large freight bills, should receive some practical proposition from the railroads on rates for tickets to the annual convention; and I would suggest that a committee be appointed to confer with the railroad commissioner on rates and arrange with him some manner in getting a special rate from all parts of the country to our next meeting place.

I would recommend a resolution being passed by the Carriage Builders' National Association and forwarded to Hon. Frank H. Hitchcock, Postmaster General, requesting that he make an effort to have necessary legislation passed to secure at once a rate of one cent for the ordinary business letters.

CHARLES A. LANCASTER, Chairman.

THE PRESIDENT: The next business of the convention will be the nomination of a president for the ensuing year.

Mr. A. E. RONINGER: It is my privilege and pleasure to put in nomination for the ensuing year for president of this association a gentleman whom you all know and I know you all respect the gentleman because he has made good. He started in the carriage business in a very small way and by his energy and pluck he has built up one of the largest carriage manufacturing institutions in the world. If ever there was a time in the history of this association that we need a live wire, a man who can make good, a man who can do things, it is now.

Mr. President and Gentlemen, I have the honor and privilege of nominating as president for the ensuing year, Mr. W. H. McCurdy, of Evansville, Ind. (Applause.)

The nomination was seconded by Mr. C. C. Hull.

Mr. THEODORE LUTH, Cincinnati, O.: Mr. President, inasmuch as the new nominee is such a handsome man I move that he be introduced to us. (Applause and laughter.)

Mr. McCURDY: It gives me great pleasure to acknowledge the highest compliment that can be given to a member, and I promise you if elected as your president to-morrow it will be my greatest aim to so conduct the affairs of this association with the aid of our efficient secretary and the executive committee that there will be no complaints made. (Applause.)

The President appointed the following committees:

Resolutions—W. P. Champney, R. S. Ward, George S. Brown, J. D. Cathey, D. M. Averill.

To Recommend Officers: W. A. Sayers, Carl P. Schlamp, George M. Hoffman, A. M. Parry, C. O. Wrenn.

Exhibition: W. J. Kauffman, E. M. Galbraith, W. J. Davis.

Obituary Resolutions—O. B. Bannister, Charles Bosher, E. W. Harrall.

RESOLUTIONS FAVORING ONE-CENT RATE ON BUSINESS LETTERS.

Presented by D. T. Wilson:

Whereas, The annual reports of the Postmaster General for the fiscal year ending June 30, 1909, and June 30, 1910, show that the first class or letter mail produced last year a profit of over \$53,000,000 and more than \$59,000,000 for the current year, which probably was entirely absorbed by the losses incurred in handling other classes of mail at less than the cost of the service,

Therefore, Be It Resolved by the Carriage Builders' National Association that the individuals and business men of the United



Here we have Messrs. Roninger and Jennison, plainly at the mercy of the bull's-eye, with an expression of "Well, do your worst, we can't help ourselves."

States should be accorded at once a rate of one cent for the ordinary business letter, and that our secretary be instructed to forward a copy of these resolutions to the Hon. Frank H. Hitchcock, Postmaster General, with the request that he make an effort to have the necessary legislation to secure that reduction enacted at once.

It was moved that Mr. Wilson's resolution as read be referred to the committee on resolutions. Carried.

Mr. DANIEL T. WILSON: Mr. President, it has been the custom from time immemorial to receive greetings from the British Institute of Carriage Manufacturers at our convention, which are read to us and for us to return to them our good wishes, and I accordingly offer this resolution.

GREETING TO OUR BRITISH BRETHREN.

The Carriage Builders' National Association in convention assembled, acknowledge the hearty good wishes of the Institute of British Carriage Builders and send greetings to their brethren across the sea with best wishes for their prosperity and happiness. Carried.

The report of Andrew Johnson, instructor-in-chief of the Technical School, was read by Mr. Wilson. [The report was printed in the September issue of The Hub.]

Thereupon the meeting adjourned until Wednesday morning, September 27, at 10 o'clock.

SECOND DAY'S PROCEEDINGS

Wednesday, September 27.

The meeting was called to order by President Richter at 11 o'clock. The program was opened by the reading of the treasurer's annual report, which Mr. McLearn read as follows:

TREASURER'S ANNUAL REPORT.

The Treasurer of the Carriage Builders' National Association of the United States submits his report from January 1, 1910, to the same date, 1911:

Cash in banks January 1, 1910	\$ 2,792 41
Receipts during the year from dues, exhibition and other sources	\$10,317 65
Received from the Associate Members' Association for banquet and other ex- penses	2,419 80
Contributions for the school	1,256 00
Present from Ware Brothers Co.	1,000 00
	<hr/>
	\$13,993 45
Total receipts	\$16,785 86
expenses during the same period:	
General expenses	\$10,232 52
Paid treasurer of the School	2,054 67
Cash in banks	4,498 67
	<hr/>
	\$16,785 86

We have a bond of the Chesapeake & Ohio Railway Company for \$1,000.00 for the benefit of the school.

In accordance with Section 2 of Article 2 of the By-Laws of the Association, we report the following new members in 1910:

Active

Harry H. Elwood, Middletown Buggy Co., Middletown, O.
Wm. A. Hunter, Fouts & Hunter Carriage Mfg. Co., Terre-Haute, Ind.
George Hackney, Jr., Washington (N. C.) Buggy Co.
D. B. Hale, Hale Buggy Co., Anniston, Ala.
Robert D. Hale, Hale Buggy Co., Anniston, Ala.
A. T. Jackson, Emerson Carriage Co., Rockford, Ill.
W. D. Miller, Dan Miller Buggy Co., Alton, Ill.
L. E. Nutt, Velie Carriage Co., Moline, Ill.
W. A. Wilson, Hampton Buggy Co., Hampton, Ga.

Associate

J. W. Anderson, Wm. Harland & Son, Buffalo, N. Y.
J. C. Byron, W. D. Byron & Sons, Inc., Williamsport, Pa.
Irwin C. Bauer, Bauer Bros. Manufacturing Co., Cincinnati.
George Budde, The Jos. Niehaus Co., Cincinnati, O.
M. F. Bishop, Greenville, Ill.
R. A. Bartholomew, Pittsburg Steel Specialty Co., Pittsburg.
Robert W. Bowen, C. A. Willey Co., St. Louis, Mo.
J. T. Boulton, Berry Brothers, Ltd., Cincinnati, O.
Charles E. Baumhicle, Forbes Varnish Co., Cleveland, O.
B. F. Conkle, B. F. Conkle Co., Junction City, O.
John J. Cope, Wm. Harland & Sons, Huntington Valley, Pa.
R. M. Cooper, Cooper Carriage Woodwork Co., St. Louis.
J. W. Curry, J. W. Curry Co., Cincinnati, O.
Frederick W. Coxe, The Crosby Co., Buffalo, N. Y.
J. R. Clary, Lee & Porter Mfg. Co., Buchanan, Mich.
E. J. Dotterer, Cambria Steel Co., Johnstown, Pa.
John V. Diefenthaler, Newark, N. J.
H. H. Dewitt, H. H. Dewitt Co., Oakland City, Ind.
Arthur Falkenheimer, Falkenheimer Co., St. Louis, Mo.
Charles J. Forbes, Forbes Varnish Co., Cleveland, O.
C. G. Guild, Buffington Wheel Co., Burlington, Iowa.
Clarence Heath, Shortsville Wheel Co., Shortsville, N. Y.
C. H. Hanford, Staples & Hanford Co., Newburg, N. Y.
O. C. Hall, Scranton Axle Co., Scranton, Pa.
Edward Huling, Chicago Varnish Co., Chicago, Ill.
F. M. Harrington, Eldred Leather Co., Eldred, Pa.
A. E. Holdt, Ault & Wiborg Co., Cincinnati, O.
W. K. Lanman, Columbus Bolt Works, Columbus, O.

Fenton Lawson, F. H. Lawson Co., Cincinnati, O.
H. A. Lomason, Douglas & Lomason, Detroit, Mich.
W. C. Martin, Illinois Iron & Bolt Co., Carpentersville, Ill.
Lee Mitchell, Mitchell Wheel Co., Miamisburg, O.
S. W. Mitchell, Mitchell Wheel Co., Miamisburg, O.
Neil Macneil, Toledo Electric Welder Co., Cincinnati, O.
E. J. O'Brien, Chandler Oil Cloth & Buckram Co., East Taunton, Mass.
Geo. W. Otting, American Tire Drill Co., Cincinnati, O.
G. M. Porterfield, Winnsboro, Tex.
Harry L. Pfeiffer, Royer Wheel Co., Cincinnati, O.
H. E. Raymond, The B. F. Goodrich Co., Akron, O.
Edward W. Rand, W. E. Derby Co., New York.
R. O. Rubel, Falls City Buggy Top Co., Louisville, Ky.
L. Sagel, National Aluminum & Bronze Co., Indianapolis, Ind.
Robert J. Stokes, Thermoid Rubber Co., Trenton, N. J.
Val Steinle, Stewart-Mowry Co., Chicago, Ill.
L. M. Smith, L. M. Smith & Sons, Newark, N. J.
Lee Sensheimer, Sensheimer Paper Co., Cincinnati, O.
George L. Smith, Newark Gear Wood Co., Newark, O.
James S. Stevenson, Berry Brothers, Ltd., Detroit, Mich.
C. B. Vandervort, C. B. Vandervort Co., Cincinnati, O.
W. W. Wachter, Swinehart Tire & Rubber Co., Akron, O.
J. J. Wiesner, Franklin Wheel Co., Franklin, O.
Charles L. Whitney, Conneaut Leather Co., Conneaut, O.
A. N. Wilcox, The Pinneo & Daniels Co., Dayton, O.
We have received contributions for the Technical School during the year amounting to \$1,256.00

HENRY C. McLEARN, Treasurer.



Mr. Summers, as may be seen, is just in front of the "Drink all you want" for 5 cents, an institution devoted to those fond of water. As may be noted he, also, has a resigned expression, as if to say, "Necessary, I suppose, but not material." When Mr. Summers was making things hum in the Summers Buggy Co. Works he didn't stand so still. Charles O. does the moving around now.

THE PRESIDENT: We will now listen to an address by Mr. E. C. Mulcey, of Philadelphia, Pa. [Mr. Mulcey's address will be found on another page of The Hub.]

On motion of Mr. McIntyre a vote of thanks was tendered Mr. Mulcey for his interesting paper.

The report of the Committee on Good Roads was to have been read by Mr. Maurice Donnelly, of Dubuque, Ia., chairman, but he was unable to attend. The report, which came in by mail later, is as follows:

REPORT OF COMMITTEE ON GOOD ROADS.

It is merely uttering a truism to state that the subject of good roads is one of the liveliest and most absorbing topics before the American people at this moment.

The rivalry between neighboring states, the competition among cities of similar size and within the same states furnish an all-powerful motive for the increasing expenditures of time and money in the improvement of the highways that traverse the particular limits. There is no more effective way to impress the tourist than to show him a superior system of roads and so the various states, counties and municipalities are putting the best foot forward through this medium, and are endeavoring to establish a comprehensive and intelligent scheme for the construction, supervision and maintenance of good roads.

The movement is away from localization to centralization and the hub of progress in this line is the national bureau of public roads at Washington, which through its engineering and chemical divisions conducts on an ever-increasing scope, object lesson roads in bituminous macadam, gravel, sand gravel, and oil gravel, roads, the cost of which naturally vary on account of location, conditions, convenience, etc. The bulk of the work of course, is with sand, clay and earth roads that have ranged in cost from \$133.00 per mile in Georgia, to \$2,815.00 in Mississippi. They have combined numerous tests on dust preventives, bituminous road binders, slag, concrete and particularly oil cement concrete. They furnish advice on constructions, surveys, preliminary inspection, explain new methods, arrange model country system for roads, bridges, culverts, indicate the effect of autos on surface, gather statistical and economical data by comparative investigation and through lectures, papers and bulletins, diffuse this information throughout the country.

It is doing a very practical university extension work and I understand that it is arranging for a permanent field experimental station, eight to ten miles long, each division to be con-

ble to cities in winter as in summer. The same writer advises all possible pressure on legislature and the influence of the Carriage Builders' Association to arrange that road work be done entirely by convict labor.

From Sidney, New York, I hear that the district has done little in the matter of the improvement of state roads and that what has been done ranges in price from \$9,000 to \$12,000 per mile which the correspondent thinks could easily be done for one-half.

From western Pennsylvania I learn that Allegheny County and the western part of the state have improved five hundred and sixty miles of macadam at a cost of \$16,000,000 per mile.



Here we see some of the Pioneers, the men who blaze the trail—and then just about preempt it. They are Messrs. A. R. Friedman, W. M. Hamilton and H. D. Hartley, of the Pioneer Pole and Shaft Co., and a more wholesome, well-liked trio it is a waste of time to look for.



Mr. O. C. Hall is in an attitude that seems to say, "Now, you would not suppose I'm just a plain spring and axle man," but don't think for a moment he is so quiet when he is jumping about the Scranton Spring and Axle Works. He is one of the mighty workers of the trade.

structed of different materials and by different methods. With this department co-operating with the various states, a comprehensive general scheme may be evolved.

From a hurried correspondence, I am told by a gentleman from Missouri that that state is very enthusiastic for the good roads movement and the farmers and city residents under the leadership of the governor have banded together on the proposition that the county pay one-half and the state the other half of a main road through the state from St. Louis to Kansas City. On completion of this central highway two other parallel roads fifty miles apart are planned to be finished within five years, and when the counties build up their tributary roads, it will create a network that will render every rural district as ac-

The county engineer reported that the brick was the better, being dustless and less expensive to maintain.

My Kentucky correspondent complains of the failure to follow up the gospel preached by a special good road's train, as most of the sample roads were spoiled through poor drainage. Henderson County has done very well with gravel roads, but as the work is done under the direction of the fiscal court there has been some evidences of carelessness and deterioration. The best district in Kentucky is the limestone around Lexington, but the greatest general improvements have been made on earth roads by the use of the King road drag.

In connection with Pennsylvania, I may mention that they have begun a road system to cost fifty millions of dollars and both Kentucky and Pennsylvania correspondents recommend that the C. B. N. A. affiliate with the American Association of Highway Improvements and send delegates to the coming convention at Richmond.

From Tennessee comes the news of a plan to build a grand state road from Memphis, the westernmost point, to Bristol on the Virginia line, a distance of six hundred miles, and to pass through some of the principal cities and branch off to others. He reports that there is considerable enthusiasm in Mississippi and Arkansas along improvement lines. The writer rejoices particularly over the national bureau at Washington and hopes for one great national road, as a salvation for the farmer, and a means of diffusing emigration, a great asset from a military viewpoint and a means of keeping American millions away from Europe. He urges that we adopt resolutions supporting the road bureau and also affiliate with the American Association of Highway Improvements.

From Michigan, I learn of the movement to have a large

part or all of the monies taken for automobile licences to be used for road improvements. This, if realized, will put Michigan in the forefront of the general movement.

From Nebraska, I hear of the general sentiment for a systematic plan for road building and at Fremont the Commercial Club has built several experimental roads under government supervision and 1912 will see many miles of sand and gravel radiating from this point.

Virginia has joined the march and in Norfolk County alone over fifty miles of macadam has been constructed, the road from Richmond to Norfolk very much improved, and roads are being rebuilt generally throughout the state.

Georgia, about two years ago, abolished the convict lease system and placed all convicts upon public roads, which has completely transformed the condition of the roads as well as furnished the prisoners with healthful work.

All the way from New Orleans comes the statement that the people of Louisiana are road enthusiasts, but they have spent much money foolishly on repairs. But now, stimulated by the promise of state and government aid, it is being more advantageously administered. The peculiar soil, lack of natural drainage, and the cost of hauling in food road material, make the project very expensive. They are just inaugurating a public highway to reach from New Orleans to Memphis.

In the light of the recent election in Canada, my correspondent at Brockville is interesting in his statements that Mr. Borden, the leader of the Conservative party, has made the proposition of good roads one of the planks of his platform and that he would appoint a commission at once. The provincial government of Ontario has already appointed a commission to educate the farmer and assist the Canadian councils by debenture plans for building roads.

The recent conference at Springfield, Massachusetts, on September 18, of the highway commissioners of New York and New England is a concrete instance of the very earnest attention that the subject of good roads is receiving, as well as a forceful reminder of the magnitude of the proposition, when we reflect that this commission has a fund of a hundred million dollars for uniform highways and trunk line routes. According to the press reports, the superintendent of public works at New York lamented the difficulty of deciding whether the country roads or the trunk lines should be built first, and he stated that the \$22,000,000.00 appropriated for the state highways, could not be spent and queried if the cost of maintenance is not too great to justify the expenditure.

Amesbury, Massachusetts, recalls the day when eighteen or twenty years ago, Colonel Albert A. Pope was the good road's evangel, stirring up that community to the construction of macadam roads that under the traffic conditions then existing might have proven indestructible. But since the advent of the automobile with the resultant suction from the pneumatic tires that strips the top dressing, an entirely new construction is involved. For the past two years, the Massachusetts commission has been experimenting for a top dressing to withstand this suction. But as yet, they have not adopted anything as a standard. My correspondent, having just returned from Europe, was particularly impressed with the idea of wood blocks treated with creosote as the ideal roadbed for automobiles. He looked at some of the blocks in London that have been down some time and could find no appreciable wear. The coating made the street easy to keep clean and yet this glazed surface did not seem to embarrass horses. In our extremely cold sections this form of road might be thrown out of alignment, but in the moderate climate of Europe it works admirably.

The gentleman from Illinois thinks that the state is very much behind the times in the matter of road improvements. It stands fifth among the states in road mileage, sixteenth in road improvements and thirty-sixth in the matter of appropriations.

Florida grants state aid and proposes to apply the system of convict labor to the public road.

Montana has recently had a good road's convention, the object of which was to get Congress to appropriate a large amount of land, the proceeds to be applied to good roads; also, a state highway commission was created.

In the state of Iowa there are three different highways inaugurated to run from the Mississippi to the Missouri River and the last legislature provided that the township's trustee appoint a superintendent for the dragging of earth roads at a wage of \$2.50 a day and an allowance of 50 cents per mile of road drag, and a township tax levy for this road fund was authorized. However in Iowa there has been considerable waste of time and money on roads and bridge construction through inattention on the part of some of the supervisors and in some instances a lack of competition in the bids. But the state is very much keyed up and is determined to put her roads in order.

Some of the states I did not hear from, but thirty-two states have enacted state aid laws, yet, only about a dozen have accomplished much, as many have not enough taxable assets to create a sufficient fund.

When we consider that after all ninety per cent of the road mileage of the United States consists of the ordinary earth road, we must arrive at the conclusion that the greatest good can be accomplished by the widespread and persistent use of the King or similar road drag. The expense is trifling, they keep the ruts out of the road, restore the crown, let the water off quickly into the ditches and one pair of horses can handle them satisfactorily. I have seen many examples of the work of this drag and it has certainly wrought wonders whenever intelligently utilized. I think that this association in general, and the good road's committee in particular, can do no more beneficial work than to impress upon the different parts of the country the absolute necessity of treating their earth roads with this drag system.

As regards our main highways or so-called permanent roads there are two kinds of surface dressing. First, those that act primarily as dust layers and incidentally as preservatives, and second, those intended to preserve and make dustless as well. The former is used considerably in the shape of solutions of soap, chloride of calcium, tar preparations and light road oil. The latter consists of tar and petroleum asphalts. But it strikes me that the solution of an intelligent and general road improvement must depend upon federal aid and federal supervision through sufficient appropriation.

Mr. P. R. Doherty, of Flint, Mich., addressed the convention on "The Future of the Carriage Industry," which appears in another page of this issue of *The Hub*. A vote of thanks was extended Mr. Doherty after which the president called for the report of the Committee on Credits and Terms, W. H. Roninger, chairman, which is as follows:

REPORT OF THE COMMITTEE ON CREDITS AND TERMS.

We are convinced that this subject must be met by each individual manufacturer, and are further convinced that the high standard of intelligence of the modern carriage manufacturer of to-day can better decide what terms will suit his particular grade of vehicles than we could possibly outline in a report.

Manufacturers have been selling on all kinds of terms and all have enjoyed prosperity, and as the standard of integrity among buyers of vehicles to-day is much higher than it was a few years ago, the losses to those who sell on four months' time are much lighter than they were in former years. Bills are paid more promptly, both on short and long time, and the opinion of the different manufacturers, as stated above, is so varied in reference to terms that it seems to us almost unnecessary to go over the same ground we have listened to at our annual convention. From remarks made by a few of the manufacturers who sell for cash, we are led to believe that they are perfectly satisfied to have the manufacturer who sells on four or eight month's time, keep on with the good work.

After a vote of thanks to Mr. Roninger for his report the

president called for the report of the Committee on Patents, of which John F. Galvin, of New York, is chairman. Mr. Galvin was not present, neither was his report, but it was announced that when received it would be given to the press for publication.

The Committee to Recommend Officers for the ensuing year reported through its chairman, Mr. W. A. Sayers, the list of nominees elected the following day, and recommended that a stronger effort be made to increase the membership and that a competent man should be employed to visit the carriage builders and solicit their membership. The committee also recommended that all firms manufacturing cars, electric or gasoline, be requested to join.

this morning, and I do not think that the gentlemen present care to hear any further speeches as the time is waning. (Applause.)

THE SECRETARY: I announce an excursion arriving from Philadelphia a little while ago with 225 passengers to visit the convention. This is a right good delegation for a country town.

Mr. C. C. HULL: Carriage makers?

THE SECRETARY: One hundred carriage makers—carriage and wagon makers.

THE PRESIDENT: There being no further business I declare the convention adjourned until to-morrow, Thursday, September 28, at 10 o'clock.



C. B. N. A. CONVENTION GROUP,

Under the by-laws all the nominations were put over till the following day.

The president announced that the next order of business would be the election of the president for the ensuing year.

There was only one nomination, Mr. W. H. McCurdy, of Evansville, Ind. On motion the secretary was directed to cast the ballot for Mr. McCurdy. He was declared unanimously elected.

THE PRESIDENT: I therefore have the honor of declaring Mr. McCurdy elected as president for the ensuing year and appoint Messrs. Keachline and Roninger to escort the gentleman to the platform. (Applause.)

PRESIDENT-ELECT McCURDY: Well, gentlemen, I appreciate this election more highly than I can tell you and I will try to do my duty in carrying along the work of the association for another year. I did not come here to make any speech

THIRD DAY'S PROCEEDINGS.

Thursday, September 28,

The association was called to order by President Richter at 11 o'clock A. M.

Secretary McLear read letters from Wm. Philipson, George N. Hooper, Frederick A. Maythorn, English coach builders, extending greeting and expressing regret at not being able to attend. These were in response to invitations sent to attend the C. B. N. A. convention. Also the following resolution forwarded by Wm. Hamlin Hamshaw, secretary of the Institute of British Carriage Manufacturers:

"That this meeting of English, Belgian and Dutch Coach-builders in conference assembled in London, sends warmest greetings to their brethren across the seas, wishing them continued progress and prosperity; and that the cordial interna-

tional relations, which have always existed between them, as members of the vehicular industry may be further extended and strengthened."

THE PRESIDENT: The first order of business this morning will be the report of the Committee on Costs. Mr. Otto Armleder, Cincinnati, chairman, has been taken ill and therefore we will have to defer that and give it in the regular way to the press to be published where you will all be able to see it. The next on our program is an address by Mr. C. H. E. Redding on the subject: "Can More Buggies Be Sold by Advertising?" [Mr. Redding's address will be found on another page of this issue of *The Hub*.]

Mr. Sechler moved a vote of thanks to Mr. Redding for his interesting address. Carried.

people and millions of feet of lumber that the railroads' combined wealth could not replace. Yet this indifference goes on comparatively unnoticed and our timber lands are neglected and a great amount of destruction is done to the detriment of the interests of the people and eventually will seriously affect our own industry.

There are several organizations which are endeavoring to take this matter up, among them the National Hickory Association, which is composed of many members of our association and the National Conservation Congress. The former organization, which was organized nearly ten years ago, has done a great deal of good work, succeeding in getting the forest service of our nation to take a more active interest in looking after the interests of the hardwoods, which are used so largely



ATLANTIC CITY, N. J., 1911

THE PRESIDENT: The report of the Committee on Conservation of Resources of the Country is the next in order. Mr. Straus has kindly consented to read it.

REPORT OF THE COMMITTEE ON CONSERVATION OF THE RESOURCES OF THE COUNTRY.

There is no more important a subject for the people of this country than the conservation of its resources, appealing as it does from the rivulets of our valleys to the apex of our mountains, to the bowels of the earth and the surface of every locality. We are living in an age of waste and destruction to ourselves and with merciless indifference to succeeding generations. To fully realize this, stop to think of the reckless railroad locomotive spark, which can make annually losses from fire, which is caused by negligence or indifferent railroad managements, resulting in the loss of human lives, houses of the

in the carriage trade. We would recommend to all of our association who are using hardwoods that they take an active interest in the Association and endeavor to work out the problem of proper forest protection, the grading of timber and disposing of the waste to good advantage. Only through organized efforts on the part of our members can this be accomplished.

The National Conservation Congress, which holds its meeting annually, and is now in session in Kansas City, is also doing some good work, but this organization is working toward the conservation of all the resources of the country, and from their reports, they are giving forestry some attention and in our judgment, it would be well for the members of the National Hickory Association to co-operate with this organization in bringing about good results. As stated, this organization is now in session in Kansas City and we recommend that the following telegram be sent to this organization while it is in session,

which is very essential to the present and future carriage builders of this country:

Thos. R. Shipp, Executive Secretary,
National Conservation Congress,
Kansas City, Mo.

Our association urges enactment and enforcement by State and Nation of effective laws for forest fire patrol in all forest; publicly or privately owned; public regulation timber cutting all forest lands; separation for purposes of taxation of timber from land on which it grows; support and extension of public forestry.

Respectfully submitted,

CARRIAGE BUILDERS' NATIONAL ASSN.,
H. Ratterman, Chairman.

Report accepted.

THE PRESIDENT: The next order of business is the report of the Committee on Abuses in the Carriage and Accessory Trades. Mr. Perrin P. Hunter is unable to be present and Secretary McLearn will read the report:

REPORT OF COMMITTEE ON ABUSES IN CARRIAGE AND ACCESSORY TRADES.

It is hard for your committee to report progress, since it never meets, unless incidentally a few moments on the day this report is due.

The committee apparently has always been appointed regardless of their interest in the upbuilding or protection of our industry.

Upon reflection, the association will see there are no abuses heaped upon the accessory trade.

As to the "Abuses" in the carriage trade, it can only apply to the abuses heaped upon the carriage manufacturer by unscrupulous dealers, who render the same bills to several concerns. Or those who allow repair bills for accidents, palming them off onto the carriage manufacturers as a part of the guarantee, that they may at the expense of the carriage manufacturer stand as being liberal with their customers.

Next come those who always abuse the terms of sale, until the carriage manufacturer is a borrower, against reason, to keep his own bills paid.

This association, through its Executive Committee or otherwise, has never outlined or suggested the slightest plan to be followed in this work of correcting abuses, as applied to our carriage industry.

Your chairman feels sure he has, by covered methods, bettered the conditions quite a little in the last five years.

Only once has this committee ever appealed to the secretary. Suggesting a carefully worded letter to a certain concern would undoubtedly secure for carriage manufacturers a great saving, but the Executive Committee preferred the association take no action.

For the benefit of the members who are wholesale builders, we suggest that the Executive Committee do permit the Committee on Abuses, with reasonable discretion, in flagrant cases, to notify the dealer that complaints have been lodged against him by members of the C. B. N. A. It surely can do no harm, but will undoubtedly check many who make a practice of intruding on the carriage builders.

If this suggestion or some other plan cannot be adopted, we move to discontinue this committee as a whole.

We hope for some discussion of this matter in open meeting.

Respectfully submitted,

PERRIN P. HUNTER, Chairman.

THE PRESIDENT: What is your pleasure on this report, gentlemen? You will note that there is a suggestion regarding the termination of the committee. The chairman hopes there will be some discussion in regard to the continuance of the committee.

THE SECRETARY: The main object of Mr. Hunter is, he wishes the association to pass some kind of a resolution suggesting something whereby the committee can be of more benefit to the association. Mr. Hunter has done great work. It has been brought to the attention of the Committee that a concern

which has been stealing from the manufacturers should be brought to a stop in its methods. In conference the Executive Committee felt that they did not have the power to do anything of that kind without the consent of the association. The facts are, as brought out by him, that he deals with the persons or firms or company and that they systematically take off about three-fourths or four-fifths of the profit every time he sells a lot of goods to it—and they practice that on other people. He thinks that some concerted action of the manufacturers of commercial vehicles might be taken whereby that person could be warned—publish it if it could properly be done without leading ourselves into a libel suit so that this stealing could be stopped. The Executive Committee in dealing with the matter did not think they were properly authorized to take such action and so they thought they would refer it back to the association. Those who have anything to say can offer it here or mail it to the secretary and we will see if a system cannot be devised whereby we can cut out people of this class who are—in plain English—thieves. Any suggestions that you want to make can be offered here or mailed to the secretary. They can then be submitted to the Executive Committee meeting in November. They are all anxious to prevent this abuse whereby you are robbed, if it can be done.

THE PRESIDENT: I suggest in order to keep this thing going a motion be made referring the matter to our Executive Committee so that it can be there threshed out and made a subject of future report to the association.

It was moved that the subject be referred to the Executive Committee with power to act. Carried.

THE PRESIDENT: The next order of business is the report of the Committee on Freight and Classification, by Mr. Theodore Luth, chairman.

REPORT OF FREIGHT AND CLASSIFICATION COMMITTEE.

Your Committee on Freight and Classification begs to report that on the whole this has been a comparatively peaceful year as between the vehicle and railroad interests.

Your chairman and most of the members of your Advisory Committee attended several meetings with the Railroad officials. The principal question involved, relative to the change proposed in the Southwestern territory, was taken up with the Executive Officers, as to higher minima and higher rates which the railroads desired to put into effect. Last October the vehicle representatives met the executive officers in Chicago, and came to a satisfactory understanding relative to the proper minima and rates, but before this argument could be made effective, it was objected to by the farm wagon interests, who also build spring vehicles and make their shipments in mixed carloads. Their objection resulted in another conference which terminated in a disagreement. While we, therefore, did not succeed in establishing one uniform minimum and rate that would have been satisfactory to the entire vehicle interests, our action in the matter, however, prevented the railroads from putting into effect their proposed increase in both minima and rates and let the matter stand as it had been under the agreement made with the spring vehicle interests about two years ago.

Regarding the question of half rates on returned vehicles and their parts from points in Western classification territory. The general question was disposed of by the Interstate Commerce Commission in their opinion No. 1388, October 10, 1910, in which they took the position that great abuse had been made of the return rule and ordered it withdrawn, but left the impression that there might be some reason for half rate applying on agricultural implements and vehicles. The railroads having complied with the order of the Commission, application was made for half rate on behalf of the vehicle and implement manufacturers, known as the Interstate Commerce Commission docket No. 3126. In this application testimony was given at a hearing before Commissioner Prouty, in Chicago, September 8 and 9, by representatives of the vehicle and other interests, but

as this entire matter will have to be presented to the full commission later, your committee is unable to state at this time what the final result will be.

Our members are no doubt fully informed of the decision of the Interstate Commerce Commission in denying application for horizontal advances in Official Classification territory and Western Classification territory. The decision resulted primarily through the vigorous protest that was instituted by the combined efforts of the shipping industries, and is evidence of what can be accomplished through united effort.

The Uniform Classification Committee has not yet handed down any opinion as to their conclusions with reference to the classification of vehicles and their parts.

Owing to the decision of the Supreme Court of the United States, the obnoxious rule of the Official Classification Committee and Trans-Continental Association prohibiting the consolidation of cars, that is to say the loading by more than one consignor to more than one consignee being eliminated our members can now make up cars between themselves to various consignees providing but one consignor is shown and one consignee and destination.

A very important matter to the members of our Association located on the Ohio River was the demand of the roads south of the Ohio River for the use of a special form of bill of lading on their shipments. They declined to accept what was known as the uniform bill of lading. This caused a number of our members expense and annoyance but the matter was adjusted by the Southern roads withdrawing from their position and accepting (as they had done for years) the uniform bill of lading. It is not probable that this question will come up again until the Uniform Classification Committee make their report and recommend the uniform bill of lading.

The roads representing the Southwestern Lines have advised effective November 19th, two cars for one may be furnished for light and bulky articles providing the combined length of the two cars does not exceed 81 feet. This is an improved amendment to the ruling now in effect.

It will be permissible after September 20th to ship carloads of vehicles to points in Arkansas to stop off to unload at points in Arkansas or to complete loading at points east of the Mississippi River when destined to points in Arkansas. This rule has been in effect for most points excepting in Arkansas and Texas for a number of years, and it is probable it will also be extended to the State of Texas in the near future.

We desire to call the attention of our members to the advisability of ascertaining the actual weight of their shipments both in carloads and less and of showing these weights on their bills of lading. It should be understood that the showing of fictitious weights is indictable and a matter of serious consequence but the showing of actual weights is permissible and desirable.

For this refer to the decision of the Interstate Commerce Commission in their opinions No. 1457 and 1458 in the cases of *W. K. Noble vs. Detroit and Toledo Short Line* and *St. Louis Southwestern Railway*. These were published in the *Traffic World*, January 14, 1911, pages 82 and 83. In these cases although the shipper gave the best of evidence as to the average and fair weight of his goods, yet for the reason that he had not weighed them and the railroads had or claimed to have weighed them, the Interstate Commerce Commission ruled that the railroad weights must govern, although as a matter of fact evidence was shown that the weights obtained by the railroad were 10,000 pounds more than the fair and reasonable weight of the contents of the car as claimed by the shipper. The result of this decision is that if one of our members loads 10,000 pounds of vehicles in a car and does not weigh them and the railroad alleges to have weighed them and says they weigh 20,000 pounds, then the railroad weights govern.

We cannot, therefore, too strongly recommend to our members that they give the question of the weight of their vehicles

and showing of weights on the bill of lading most careful attention.

Respectfully submitted,

THEO. LUTH, Chairman.

C. A. BARNARD, Sec'y Advisory Com.

PRESIDENT McCURDY: I move that a vote of thanks be tendered the chairman and that the report be received. Carried.

ELECTION OF OFFICERS.

Mr. McLear read the report of the Committee on Nominations recommending officers for the ensuing year, as follows:

Executive Committee for Three Years—Chas. C. Hull, Connersville, Ind.; Chas. H. Lancaster, Merrimac, Mass.; G. A. Brockway, Homer, N. Y.; C. O. Wrenn, Norfolk, Va.; W. A. Sayers, Cincinnati, O.

Secretary-Treasurer—Henry C. McLear, Mt. Vernon, N. Y.

Trustee of Technical School—Wm. R. Innis, New York, N. Y.

Vice-Presidents—George S. Brown, Cincinnati, O.; John L. Mason, Davenport, Iowa; James Neal, Amesbury, Mass.; D. B. Hale, Anniston, Alabama; Charles B. Hatch, New Fairfield, Conn.; S. B. Cooling, Wilmington, Del.; H. B. Staver, Chicago, Ill.; William Shafer, St. Louis, Mo.; J. C. Wilson, Detroit, Mich.; John E. Hayford, Newton, N. H.; John Colyer, Newark, N. J.; L. M. Fitch, Rome, N. Y.; George Hackney, Wilson, N. C.; Robert Gray, Chatham, Ont.; H. F. Keachline, Philadel-



This is to show how well leather and varnish go together in the persons of E. E. Lowndes, of T. P. Howell & Co., and Chas. J. Forbes, of the Forbes Varnish Co.

phia, Pa.; Carl B. Schlamp, Henderson, Ky.; Owen Lilly, Memphis, Tenn.; Charles G. Boshier, Richmond, Va.; August J. Kaestner, Milwaukee, Wis.; J. B. Carmichael, Jackson, Ga.; A. M. Parry, Indianapolis, Ind.; Clifford F. Barnett, San Francisco, Cal.; L. F. Weaver, Portland, Oregon.

Mr. Sechler moved that the rules be suspended and the secretary cast the ballot of the association for the member named for the respective offices. Carried.

The Chairman called for a report of the Committee on Resolutions.

Mr. CHAMPNEY: Your Committee on Resolutions, in reference to the resolution of letter postage beg leave to report—there might be a little explanation made. On first class matter the rate is two cents an ounce or fraction of an ounce—32c a pound or \$640 a ton. On second class matter, which is the publishers' rate, one cent a pound or \$20 a ton; on third-class matter, eight cents a pound, or \$160 a ton; on fourth-class matter, such as merchandise, a cent an ounce or sixteen cents a pound or \$320 a ton. Here we have the second-class \$20 a ton. I am informed that the actual cost of doing this work is about six and

three-quarter cents a pound. The Government loses on this class of work \$115 for every ton handled. It is the purpose of the Postmaster General, and he has incurred the animosity of some of the publishers—to advocate an advanced rate. Your Committee believes that it is unwise to advocate one cent letter postage until the second-class rate is raised at least to the cost of handling. When that is done I think we can safely be assured of a one cent letter postage. Your committee, therefore, beg to report adversely to the resolutions. Carried.

The President called for the report of the Committee on Exhibitions. The report follows:

REPORT OF COMMITTEE ON EXHIBITS.

It was with great pleasure that your Committee on Exhibits made an inspection of the display in the Exhibition Hall, for seldom in the history of the C. B. N. A. has the present accessory exhibit been equalled. The artistic arrangement of booths, office equipment and other inviting features made it a pleasure to visit the exhibits. Another thing worthy of mention is the fact that business has been unusually good during the convention, and there is a satisfied feeling pervading the hall.

Respectfully,

W. J. KAUFFMAN, Chairman.

REPORT OF THE COMMITTEE ON OBITUARY.

Mr. O. B. Bannister of the Committee made the following report:

Whereas, An All-Wise Providence has taken from our number to himself

Active Members

Grant Howard Burrows, ex-president, Burlington, Vt., Nov. 26, 1910. Age 75.

William Thomas Jones, Carthage, N. C., Nov. 29, 1910. Age 77.

Anthony G. Brunsman, ex-president, Cincinnati, O., March 1911. Age 45.

H. G. Shepard, New Haven, Conn., April 22, 1911. Age 76.

W. F. Stewart, Flint, Mich., May 20, 1911. Age—.

H. A. Peckham, Lowell, Mass., March 12, 1911. Age 40.

Associate

George H. Fernald, North East, Pa., January 24, 1911. Age 47.

Thos. P. S. Kelly, Philadelphia, Pa., July 27, 1911. Age—.

Resolved, That we deeply deplore their loss to their families and our organization. We must all answer to the one and last call of our Creator, and say: "Thy will and not ours be done."

Resolved, That the secretary be instructed to have a copy of this resolution spread on the minutes and a copy of same sent to the families of the deceased members.

On motion the report and resolutions were adopted by a rising vote.

Mr. WOODHULL: Mr. Chairman, I cannot permit myself to allow the announcement of the death of Grant H. Burrows to pass without in my weak way to make a slight reference to his wonderful work as a man, and to the important work he has done in the many years in which he was connected with us as a layman and as a member of the Executive Committee, and as President. There was never a meeting too far from his home that would keep him from it. There was no man in the whole association who was more ready to lend his voice and his influence to the uplift of the carriage industry, and in fact, to the uplift of his fellow man in whatever way or in whatever walk of life he may have found him. He was an admirable man. One thing I liked about him was that he was never pessimistic but always optimistic. He saw the best side of things. Those who knew him intimately knew that he was always pleasant, always glad to give a warm welcome, and a cheerful greeting to everybody. You know his history—his rise and fall. When he was at the zenith of his power in Cincinnati, money was thrown at him, but when he did not have the money everybody wanted it. He made an attempt, when he failed, to pay one hundred cents on the dollar, but unfortunately, he failed again, so soon, that his liabilities as a whole were not met. Yet, it was that very failure that made him a success. His character for unrightness

stood the test of time, and he went over to Canada to rebuild, not a fortune, but he made an honest competency. He showed in his latter days that character that belonged to the race from which he came in Vermont—the type of men to whom this country owes a debt of gratitude for energy, patriotism and uprightness.

Mr. J. F. TAYLOR: It has devolved on me to endeavor to express regrets for the departure of our friend Anthony G. Brunsman. I speak of a man who was known to every member of the association, respected by all, loved by many, and loved most by those who knew him best.

I had known Mr. Brunsman for twenty years. Some of you remember him thirty years ago. You knew him in his youth, when as a lad he worked for Anderson, Harris & Co., in Cincinnati, Ohio, sweeping out the office and building the fire; a few years thereafter, when he had gathered together a small capital, and without much experience, stepped forth in the great arena of life to contend for trade and success; at a time when such prominent firms as The Standard Wagon Co., Emerson & Fisher, T. T. Haydock & Co. and Hiram W. Davis & Co., were the prominent factors in the line. During the panic period of 1893, all these went down in the storm, but our friend's enterprise weathered the storm and sailed on into smoother waters. He established a business that was known from the Atlantic to the Pacific; and at the time of his death he stood as one of the representative carriage manufacturers of the United States, known in all our country, whose trade reached into foreign lands. He was indeed a success, and it can be said of him that he was not only a success in a business way but in all the noble qualities which go to make up a manly life.

In the height of his success, when his sun was at its zenith, everything seemed to him ready for the enjoyment of the harvest from the seed he had sown—he had built himself one of the finest residences in Cincinnati, and was now ready, as he told me one day, just before he changed from a partnership to a corporation—to retire from active management of his business affairs, he says, "I want to close this up and get away. I have worked hard and worked long, and I want to travel and go to Europe," and just as he was getting ready to enjoy life the sudden call came and he passed into the Great Beyond. We have our great men—men who remain whom we honor, and we wish they could remain with us many years more, and the longer they stay with us, the dearer they become; I think it was some such sad event as this, which caused the poet to write those words: "The good die first, and those whose hearts are dry as summer dust burn to the socket."

I would honor the genius of a man like Anthony G. Brunsman down among men, simple in all his ways, even when he had gained a fortune; the same plain fellow, ready with his hand-shake, always gentle and kind, with a smile upon his face, even while his vitality was being preyed upon by an insidious disease. Unselfish and loving, he sowed the seeds of kindness; high-minded; and of generous spirit; a delicate sense of honor, truthful and faithful to all trusts and duties; doing bravely and cheerfully day by day, those things which fell to his hands; submitting to the sorrows of life because of his belief in a wisdom above his own.

There come moments when some intimate experience is confided to us and then in the pause of talk we become aware that we are in the presence of a human soul behind the familiar face of our friend, and that we are on holy ground. One day in New York, one Sunday evening, as we passed along the street above Forty-second, we heard music, and as we stopped we looked up and saw a church, and we walked in and for a half an hour we listened to the grandest music than it has been my pleasure to hear. As we came out of the church there was a feeling in his heart and in mine that made us open in our communications, and we talked of things then that we had never talked of before. He spoke of dark nights that he had passed through. He spoke of the deep waters that he had crossed.

It showed me there was a depth to his nature like the depth

of the ocean, and underneath it all there was a place where the storm of life came not, which made me think of the caves beneath the ocean. "In the ocean are caves deep and silent and lone, while above roll the waves, beneath these are none."

Gentlemen, in conclusion I would further say in respect to his memory, let it remain with us as an incentive for more earnest efforts and nobler life, and as he sleeps in his last resting place "may the grass be green above him, the friend of our bygone days. None knew thee but to love thee; none named thee but to praise."

Mr. BANNISTER: Mr. Chairman, I would like to move that a copy of the remarks which have been made be sent to the families of the deceased members as well as a copy of the resolutions. Carried.

Mr. Luth offered the following resolutions:

As our association was the first national organization to prepare resolutions advocating a permanent tariff commission and which resolutions were adopted at our convention meeting at Atlanta, Ga., 1905, and

Whereas, The business conditions of our country have possibly been much disturbed by recent consideration of the tariff revision in Congress, and believing it would be beneficial to the business interest of our country to defer consideration of tariff revision until after the committee which has been appointed has had time to make report of their investigation, therefore, be it

Resolved, That the C. B. N. A. in their 39th annual convention assembled urge upon Congress to defer any further tariff consideration until final report is made; also

That we urge upon our representatives in Congress the importance of as prompt action as possible be taken in the establishment of a permanent tariff commission, and

Our secretary be authorized to send a copy of these resolutions to the President of the United States, and also to the Vice-President of the United States and the Speaker of the House of Representatives. Adopted.

Appropriate resolutions were passed thanking the press, the Hotel Men's Association of Atlantic City, as well as the city government and citizens, and to the retiring president.

The next and final business was the selection of the meeting place for 1912. It resulted in the selection of Atlantic City by the following vote: Richmond, 45; St. Louis, 48; Atlantic City, 73.

The convention then adjourned sine die.

ANNUAL MEETING OF THE ASSOCIATE MEMBERS OF THE C. B. N. A.

In the absence of President A. L. Phillips, J. F. Tylor, of Cincinnati, called the meeting to order. Homer McDaniels, secretary, read the minutes of the last meeting held in Cincinnati in 1910.

The chairman appointed the following nominating committee to select officers for the ensuing year: Messrs. O. E. Walker, W. P. Champney and C. E. Adams.

That committee reported the following:

President—D. E. Clapp, Auburn, N. Y.

Vice-President—O. B. Bannister.

Secretary—Homer McDaniels.

Treasurer—O. E. Walker.

Members of Executive Committee—O. B. Bannister, chairman; Henry Higgin and A. J. Murray.

Louis Straus was recommended as a member of the Executive Committee representing the accessories on the Executive Committee of the C. B. N. A.

They were duly declared elected.

SECRETARY McDANIEL: I might say that usually we have a report of the treasurer, but last year we waived that and waited until the close of the meeting, and then printed the report and mailed it to each subscribing member.

Mr. Champney moved that the same plan be followed this year. Carried.

Addresses were called for from the various newly elected officers.

Mr. CLAPP: Mr. Chairman, if the duties of the office to which I have been elected are merely to preside as the present official is presiding I will endeavor to fulfill them, and I thank you for the honor conferred upon me.

Mr. STRAUS: I was quite surprised at being re-elected. It is quite an honor to be elected two consecutive terms as a members of the Executive Committee of the C. B. N. A. The report of the Secretary shows the Association to be in a good condition. We have lots of money on hand, but it is important that we should supplant the loss in our membership by death with the addition of new members—younger men. We are looking with a great deal of expectation to the South for new members. We have got to have new members. The carriage industry of the South is important. We expect a Southern



D. E. CLAPP, President C. B. N. A. Associate Members.

member will be elected on the Executive Committee of the C. B. N. A. to-morrow, and we hope for many new members from the South. I thank you very much for the honor.

Mr. Adams brought up the matter of the Executive Committee to retain as large a fund in the treasury as had been customary in the past. It was finally moved and carried that the Executive Committee be requested to divide the surplus at the end of the year among the subscribing members, leaving in the hands of the treasurer for future emergencies a fund not exceeding \$500.

Mr. Adams brought up the matter of the Executive committee preparing such a program for the next meeting of the Accessory members as would attract a larger attendance to the meetings. After some discussion it was the consensus of opinion among those present that the members of the association representing the various trades should be asked to address the association on special topics of interest to the associate members, that this meeting should be held on Wednesday evening during the convention of the C. B. N. A. and that the regular proceedings of the association precede the addresses of the various members on special topics; also that a smoker be one of the features of this meeting.

TWENTY-FIRST ANNUAL C. H. A. T. CONVENTION.

The twenty-first annual convention of the Carriage, Harness and Accessory Traveling Salesmen's Association was held at the Marlborough-Blenheim, Atlantic City, N. J., Tuesday evening, September 26. In the absence of President Huston, the convention was called to order by ex-President Grant Wright.

The minutes of the last convention were read and approved, after which President Huston's address was read. It said, in part: "I believe in the principles of the association and earnestly request a loyal support on the part of its members. This is the day of co-operation, and we must stand together. During the past year we have materially increased our membership roll and there is no reason why we should not continue to advance. There is a broad field before us, and it is up to every member of this organization to bring new members into the flock.

"One word relative to the employment bureau feature of our organization; you all know something of this feature of our work, but doubtless few have stopped to contemplate the great possibilities for good that such a department may exert; this bureau is ready and willing at all times to assist its members in securing positions, and any employer need have no hesitancy

to our association which should appeal to every salesman, viz: assisting those out of employment to positions. Your board regrets to again announce that this important object has not been as operative as it might have been, largely because members have failed to advise the secretary of the names of those seeking positions, and in the failure or neglect of employers of salesmen to advise the secretary of their requirements. With proper co-operation, this feature can be made a valuable "Bureau of Information," and we request the journals of our trade to emphasize this feature and give it wide publicity.

"Your board held a meeting in New York City in July, at which it decided it would be wise to meet with the C. B. N. A. at Atlantic city this year, owing to the discontinuance of the Carriage Dealers' Convention and Exhibition in New York City this Fall.

"The impartial plan of honoring each branch of our membership with the presidency has worked well. The year just closing has been "trade press year" and President Huston has been a splendid standard bearer, both financially and for membership.

"We express our appreciation of the great courtesy of the publishers of the several trade journals.

"Our annual dues are so nominal that delinquents are delinquents either from indifference or neglect. We recommend that those who are two years or more in arrears be dropped from membership and the neglectful be seen personally where possible."

The report of Secretary-Treasurer Jesse L. Nelson was then submitted, which showed a healthy financial condition and a pleasing increase in membership.

The necrology committee reported on the death of Brother George Grim, and the secretary was instructed to spread a memorial on the minutes and transmit a copy to his family.

A very enjoyable session followed, during which addresses were delivered by the following members:

Fred. H. Gowen, Little Falls, N. Y.; Henry E. Copeland, West Newton, Mass.; Grant Wright, Philadelphia, Pa.; W. W. Wood, Philadelphia, Pa.

A pleasing incident of the convention was the presence of Mrs. Alice M. Ettling, the only woman honorary member of the organization. A vote of thanks was tendered Mrs. Ettling for the interest manifested in the association.

The officers elected for the ensuing year are as follows:

President—A. E. McGrew, Martin Carriage Works, York, Pa.
Secretary-Treasurer—Jesse L. Nelson, re-elected.

Directors—C. C. Hayes, chairman; New York City; C. E. Sorin, Cincinnati, O.; W. W. Wood, Philadelphia; J. A. Bent, Baldwin, N. Y.; Grant Wright, Philadelphia; P. D. Randall, Springfield, Mass.; E. B. Williams, New York City; F. H. Gowen, Little Falls, N. Y.; H. E. Copeland, West Newton, Mass.; George W. Huston, Cincinnati, O.; John F. Galvin, New York City.

The meeting then adjourned subject to the call of the Board of Directors.

The Dinner at the Inlet Hotel.

The official C.H.A.T. ceremonies terminated with a dinner at the Inlet, Wednesday evening. This is a famed Atlantic City place to get sea-food in perfection and cooked by Mine Host Soulas in a way to make it a gastronomic memory.

The pleasant dining-room was filled with perhaps 175 members and guests. The proceedings were enlivened by songs and instrumental music supplied by colored minstrels. It was an appreciated feature.

Ex-President Huston presided, but he relegated the honors of toastmaster to Mr. Grant Wright, who performed the duties with grace and cleverness. President Richter, as well as ex-President Lancaster, Mr. George Babcock, Morris Woodhull and C. H. E. Redding were representatives of the C. B. N. A. present.

All were called upon to say something, and with the speakers identified with the C. H. A. T., who were led by W. W. Wood, the evening passed merrily.



A. E. MCGREW, President C. H. A. T.

in making application through the C. H. A. T. for the services of one of our members who may be out of employment. Here is where the spirit of co-operation and assistance strongly manifests itself, and here is where we have a right to boast of the principles of our organization. Let's all unite to make the employment bureau feature one of our chief assets; I believe if we explain this matter to non-members we can easily double our membership within another year."

Following the address the report of the Board of Directors was submitted by W. W. Wood, chairman: "In the rapid flight of time it is not a far cry to that November day in '91 when a score of the 'Knights of the Road' assembled in Cooley's Hotel, Springfield, Mass., and laid the foundation for our association's up-building. Twenty years have passed, and some of the charter members—the founders—are with us to-day. There is no necessity to argue with those present the benefits of association of kindred interests. The fact of your presence is sufficient evidence that you believe it is good to be here. It is to that large number of 'Indifferents,' we appeal—we believe that their non-support is due more to lack of interest, than to antagonism. A tithe of the energy expended in getting an order, directed to getting a new member would soon double and treble our roll of membership.

"While our objects are largely social, there is a business side

ELECTRICITY AS RELATED TO THE VEHICLE INDUSTRY

E. C. Mulcey, Philadelphia, Pa.



THE application of electricity to all sorts of uses and purposes has become so much a part of our daily life that we now accept it as a matter of course and rarely stop to consider the vast change and improvement which it has brought about.

In our homes electricity is used for lighting, it is used for cleaning, it is used for cooking; electric toasters, chafing dishes and other cooking apparatus are rapidly coming into service;

electric flatirons are very widely used, even curling irons are heated by electricity; the front door bell, call bells, and the telephone are such old friends of ours that we have almost forgotten their being electrically operated.

Our streets are lighted by electricity, a great deal of advertising is done with electric signs, we have electric cars and electric fire systems, the newsboy on the street sells a paper, the contents of which have been transmitted from all quarters of the globe by the telegraph and printed by electricity. In our factories and offices we again find electric lights and electric call bells; interdepartment telephones connect us with every official in the plant; the electric dictating phonograph we find indispensable in answering our correspondence and in giving instructions; the telautograph is coming largely into use for transmitting orders in writing; the electric clock on the wall is kept at Washington Observatory standard time; electric elevators are used both for passengers and freight.

However, none of the above practical applications of electricity have any peculiar or special relation to the vehicle industry. They are utilized in the world of business in general, and while the vehicle manufacturer makes use of them, they are not special adaptations of electricity to the business of vehicle manufacturing. There are, however, many electrical inventions and adaptations of electricity, which were devised solely for employment in vehicle plants, and are finding a large field of usefulness in that employment.

Let us suppose that we are being shown through an extensive vehicle factory where modern methods are in vogue, and where efficiency is the keynote. First let us visit the blacksmith shop. Here we find the blower, welding furnace, drilling machine, drop hammer, tire bender, tire setter, power shears and punches and perhaps some other machines, all deriving their motive power from the electric current.

In the woodworking department we note the planers, circular, hand swing and rip saws, universal wood workers, wood boring machines, hub and spoke lathes, hub mortisers, spoke tenoners, sanding and other machines, all harnessed to the electric current and driven singly or in economical groups.

Passing to the trimming department, we are introduced to the electric power tufting machinery, the electric cloth cutters, and the electric-driven sewing machines. In the paint shop the vacuum cleaner keeps the apartment free from dust and this, together with the revolving ventilator, is run by the electric current.

The increased use of electricity in vehicle factories has been a conspicuous development during the past few years, the current in some cases being generated on the premises, but in more instances being obtained from an outside central station, both systems having their advantages.

The convenience of this form of energy is beyond question, and its economy has been conclusively proved. A turn of a switch and the machine is running. No fire to start, no coal to handle, no crank to turn, no coaxing of gasoline and spark into action. A single motion of the wrist, the motor whirls and the machines are ready for work.

Messrs. Crocker & Arendt, in their recent book on electric motors, have summed up the general advantages of electric motor drive, somewhat as follows:

Saving in Power—Owing to the absence of belting and shafting losses, which are usually 60 per cent of the power available, there is a great saving of power. The cutting off of the power entirely, when not actively producing, is also the source of another immense saving.

No Limit to Amount of Power—There is a limit to the power that can be transmitted by belt. There is none to that of the electric prime mover, and the electric power can be transmitted and subdivided or combined with the output of other generators.

Lessened Cost of Buildings—Buildings in which it is planned that electric power is to be used can be built of lighter materials, not having to support the weight of hangers and overhead shafting.

Cost of equipment for the electric installation is certainly not higher than other methods, and maintenance expenses are considerably less.

Convenience—Electric motor drive enables the machines to be placed more conveniently and permits the use of portable equipments so that the machine may be taken to the work when desirable, instead of taking the work to the machine.

Better Light and Ventilation is secured through the elimination of overhead belting and shafting.

Cleanliness—No oil drippings on floors or material and no dust continually being agitated by the travel of belts and pulleys.

Less noise is occasioned when motor drive is employed, as the rumbling of shafts and slapping of belts are entirely done away with.

Health of employes is conserved owing to the better light and ventilation and the absence of dirt and dust.

Speed control with the motor makes a wide variation available to suit every machine in the establishment.

Flexibility and adaptation to growing needs of the plant is an important feature. With shaft and belt drive it is frequently necessary to replace the original shafting when buildings are extended, so as to allow for the additional requirements of the extension. Electric power is also convenient for running into detached buildings, and it must be remembered that detached buildings are an approved manner of protection against the spreading of fire.

Overtime work, where motors are used, does not require the running of an entire factory or floor full of shafting, when only a few machines are working.

The growing appreciation of the value of electric drive in vehicle factories has been greatly stimulated by the efforts of manufacturers of electrical machinery to meet the particular needs of the industry by designing motors especially adapted to the operation of machines used in this branch of manufacture.

Makers of motors realize that the practical manufacturer will only consider the application of electric power if, by so doing, he can see clearly that he will thereby insure, first, uninterrupted operation, and second, a saving in the cost of produc-

tion either by increasing the quantity of the product with the given tool equipment, or by a reduction in operating expense. That electric drive combines all these features is evidenced by the preceding outline of the principal advantages it possesses when compared with the mechanical drive. Experience has shown that it improves the quality of the product and increases the factor of safety both for the machinery and operatives, while at the same time there is a marked reduction in the fire hazard.

The relative values of group and individual drive must be determined in every instance by a careful analysis of the requirements of the installation, and while there are many successful examples of economical group drive, it is now the consensus of competent opinion that in a large majority of cases the highest efficiency, both for the machinery to be driven and for the electrical equipment, can be best obtained by the application of a separate motor to each unit of machinery. This is especially true where the operation of the machines is intermittent, as in this case the cost of current, if obtained from an outside source, is entailed only during the actual operation of the machine. If, on the other hand, the plant utilizing motor drive is provided with an isolated generating outfit the size of both prime mover and generator (as well as the power factor in the case of alternating current plants) will be appreciably affected by the choice of group or individual drive. In the latter case, each machine can be equipped with a motor which will most nearly meet the exact requirements in regard to the maximum desirable speed and the amount of power delivered at the driving shaft.

Whenever cost comparisons have been accurately made on the basis of factory output, electricity has been found to reduce the cost of production, provided the individually driven machines and those driven in groups have been intelligently installed. As the cost of current varies with the locality and with local conditions, the choice of installing a generating plant on the premises or obtaining from outside sources must be decided by a knowledge of the relative expense of each individual case.

Let us now consider the application of electricity to vehicles themselves.

The arrival of the automobile has broadened the scope of the wagon and carriage builders' art; it has brought to the manufacturers of wagons and carriages unexpected possibilities and opened up to them new fields for the sale of their product.

The man who manufactures gas engines or the one who makes electric motors and appliances can take their own products, assemble them on a frame, support the whole thing on springs and on four wheels and put on the market a power vehicle which may do very excellent work. The wagon and the carriage builders, however, could surely make many little improvements here and there, perhaps to the springs or to the method of suspension, to the axles, the steering device, the wheels, etc. They should be able to build a better body, both as to strength, for freight delivery, and as to appearance, finish and comfort for pleasure vehicles. The automobile to which the vehicle builder has contributed his share in construction should therefore be a better automobile. So it is clearly up to the wagon and carriage builders to go into the manufacture of automobiles by getting together with experts on engines, electric motors, storage batteries, etc., and thus put on the market the best product which can be constructed.

The automobile is not a competitor in opposition to the vehicle builders' interest unless the wagon and carriage builder allows it to be. The automobile is strictly a branch of vehicle building, it is a development of that art brought about by the requirements of modern times.

The public has decided that it wants power driven instead of horse-driven vehicles. You are not selling horses, you are selling vehicles, and it is vehicles that the public wants. Whether for pleasure or for business purposes the public is willing to pay a good price for a good power vehicle, and vehicles are more in demand now than ever before. It is up to the vehicle

builder to move with the times, to do its share in the present development of the transportation problem and incidentally to increase his profits.

It is not necessary for the vehicle builder to go into the business of designing and building engines, electric motors, storage batteries, tires or other specialties. These he can buy at reasonable prices from manufacturers who will design these parts to fill the requirements of each individual builder. The problem before the vehicle builder is mainly to design and build the body, perhaps also the frame and the running gear; to determine on the proper distribution of weight, on the correct springs and method of suspension, on the method of transmitting power to the wheels, etc., and the vehicle builder should be the proper man to work out these details.

The first thing to decide is of course the method of propulsion which you will adopt. In the early days of the automobile, steam was largely used, but was afterwards almost entirely replaced by the gasoline engine owing to the greater simplicity of the latter and consequently its greater reliability.

Electricity through the agency of storage batteries was tried in the early days. As improvements were made to storage batteries, to motors and other parts, the electric vehicle came into greater use; by its simplicity and reliability of operation it showed its worth in many classes of service and its growth during the last few years has been quite remarkable.

The most striking feature about the electric vehicle is its simplicity. A storage battery acts as a reservoir of electrical energy, a motor transforms the electrical energy directly into rotary power and the power is transmitted to the wheels by means of chains, a shaft or gears. A multiple contact switch, known as a controller, makes the necessary changes in the motor circuit for running at various speeds as well as for starting and stopping.

There is no ignition circuit to adjust, no cranking of the motor, no oil to regulate, no change of gears for speed regulation, no vibration, no noise, no odor. The operator moves the controller handle forward one notch and the car starts smoothly and quietly, an additional notch or two increases the speed. Controllers have in general two starting notches or steps and three running steps. Moving forward the controller handle increases the speed, moving it backward reduces the speed, bringing the handle back all of the way cuts off the power supply.

This great simplicity of operation means that any one, even a child, can drive an electric car, and with more safety and pleasure than a horse-drawn vehicle or any other form of power vehicle. It means that in commercial service any driver of horses can drive the electric wagon or truck.

The most important part of the electric vehicle, in fact that which makes possible the use of electricity for motive power is the storage battery. The storage batteries first used in vehicles were bulky and heavy, they propelled a vehicle 20 to 30 miles. The first electric vehicles, therefore, were rather expensive to operate and they were unreliable on account of the low mileage obtainable. Many improvements have been made to all the various parts of electric vehicles in recent years, but the greatest achievement has undoubtedly been in the improvements to storage batteries, which have made practical distances of 100 miles or more with pleasure cars, and of 50 to 60 miles on one charge of the battery with freight wagons and trucks.

The battery which has done the most in the last few years for the advancement of the electric vehicle, particularly in freight transportation service, where the work is most severe, is the thin plate lead battery. This battery has characteristics which make it particularly adaptable to vehicle service. It has high capacity, which means long mileage per charge. Its discharge voltage is higher than any other type of storage battery, especially at high discharge rates, which means high speed when climbing a hill. The thin plate battery is built so as to need no cleaning during its life, which means that a vehicle thus equipped will very rarely if ever be put out of service for

repairs to the battery. The thin plate battery is very little affected by temperature changes, and its life, under proper conditions of service, is considerably greater than that of other lead types.

A storage battery of correct design and characteristics, an efficient motor and a properly constructed controller, can be mounted by the vehicle builder on a frame and body of his own construction, with an efficient transmission system, a sturdy steering gear and a good brake.

It is this simplicity of construction and the total absence of vibration in running, which gives the electric three or four times the life of a gas car. It is again its simplicity which makes the electric so reliable in all classes of service. It is a very unusual sight nowadays to see an electric broken down or out of power.

Have you ever seen a man on his back on a dusty road struggling with a wrench or something under a car trying to get it to run? Perhaps you have been there yourself. This is unknown with an electric car, the motors, the controller, the batteries, all the vital parts are so built and placed as to be easy of access for inspection and repairs.

Let us suppose something does happen to an electric on the road, and let us see how we should repair it. We can practically exclude the motors right from the start; motors have been brought to a high state of perfection and motor troubles are almost unknown. Controller troubles are scarce but there might be a contact burned off. Well, what of it? That cuts out one speed, we have three or four others. It simply means running a little faster or slower than we had anticipated and the damage can usually be repaired in a few minutes at the garage. There is one other place, the storage battery, a jar might break, that cell can be cut out of circuit by connecting across its two terminals either by wrapping a wire around them or by inserting a piece of metal between them; a cell connection might break, again a wire wrapped around the two adjacent terminals will fix matters. I think that's about all. Of course, we may have tire troubles, unfortunately no car is immune from that, we can only say that electrics are no more, and usually less, liable to them than other vehicles.

The electric is distinctly the car for steady, all year around service. It can be relied upon day after day, winter and summer, year in and year out. Many an electric runs year after year with scarcely a day's interruption except for yearly repainting at which time the batteries and other parts can be overhauled if necessary.

In general, when the mileage required is within the scope of the electric, it will perform the service more economically and with greater reliability than it can be done by any other method of transportation. The limitations of the electric are therefore in the possible mileage per charge. In the last few years, however, the mileage of electrics has been increased 100 to 200 per cent and there is every reason to believe that future improvements will bring further increase in that direction.

Now, why should not the wagon and carriage builders get their share of this rapidly growing business?

The automobile industry has to a certain extent slipped out of the hands of the vehicle builders, due to their failure in many cases, to see the opportunities offered them. The opportunity is still here, however, but the question to many vehicle builders is how to grasp it, that is how to get into this new branch of vehicle building without the investment of large amount of capital. There are a number of ways in which this may be done and the method adopted by each vehicle builder will very largely depend upon the facilities he has at hand. The builder who wants to go into the construction of electric vehicles complete must, of course, have large and complete machine and erecting shops, not to speak of body building and paint shops which are in any case an important part of the vehicle builders' equipment. The special parts, as already stated, can be bought easily. Motors can be obtained from almost any of the large manufacturers of electrical machinery,

and these manufacturers co-operate with the electric vehicle builder, giving him the benefit of their experience in the design and proper use of electric motors. Controllers can be purchased from the same electrical manufacturers. In the choice of a battery will possibly lie the most difficult problem for one starting out to build electric vehicles, and here as everywhere else it should be remembered that the electric vehicles must perform certain definite functions at the lowest possible cost to the owner. The characteristics of various batteries can then be determined and compared in order to decide on the battery best adapted to each case.

There is no difficulty whatever in obtaining all these specialties at the right prices and the vehicle builder need but let it be known that he is going to build "electrics" and he may be surprised at the unexpected number of manufacturers of motors, tires, storage batteries, etc., all ready not only to quote prices but also to help solve problems of construction in order to "boost" the business.

Other vehicle builders, not desiring to go so deeply into electric vehicle construction, can only buy chassis from electric vehicle builders or perhaps act as agents for the latter and build the bodies.

Vehicle builders will also find that a number of the manufacturers of "electrics" would gladly give contracts for body building as this takes up much valuable space which they could use to better advantage.

All vehicle builders should familiarize themselves as much as possible with the electric vehicle; the number of electrics is growing rapidly and therefore the vehicle builder will be called upon more and more for repairs and adjustments. If he is familiar with this class of work it will be his as it should be; if not, someone else is going to get it.

The electric vehicle came into use very gradually at first, its use grew rapidly with improvements and now its growth is strong and healthy. It is a growth which comes of simplification. In the gas car improvements have frequently taken the form of additional parts and complications. The electric, however, has been improved by simplifying all the parts and their operation. For this reason wherever an electric can perform the desired service, it is bound to win out and as the work possible with electrics is being steadily increased the day is coming when they will predominate all classes of service.



This was snapped just to show that men in the vehicle industry are good lookers from any point of view. This is no consultation on prices, or Beck wouldn't be standing off to one side, hands in his pockets. His hands would be in the other fellows' pockets, as a mere leather proposition.

CAN MORE BUGGIES BE SOLD BY ADVERTISING?

C. H. E. Redding, New York City.



THE answer is to be yes, but it is not the same as a statement that buggies CAN be sold by advertising. That assertion would not stand the acid test. A statement is neither an argument nor a pleading, thus it compels the writer to assume an assertive tone that is not at all modest, but it is the subject not the speaker that is the malefactor of want of taste. For the buggy builder, ad-

vertising is a fallow field. He has never cropped it. The soil has been scratched here and there, but no sustained effort has been maintained. I think he may be likened to the young man in the parable who kept HIS talent covered. It seems to me it should be uncovered and be made to produce.

Just for a paragraph, let us stop to consider the advertiser, rather than the advertisement. It may help us to a better understanding. Here we find extremes among men as elsewhere. One expects more than is possible, another less than is probable, neither weighing the subject fairly, and both the victims of disappointed expectation at the end.

The man expecting little or nothing as the result of an advertising campaign is beaten at the start. He might just as well capitulate before beginning the fight. He suffers the experience of those of little faith, no matter what the occasion. The one who expects MORE than is possible is not led to his conclusion by a spirit of confidence. More often than not he is totally bereft of that attribute, but once having been persuaded to take the matter up, he plunges in headlong without scruple or calculation, a partizan of the impossible. His final disillusionment can only be measured by the grotesqueness of his unbusiness-like expectation.

Both of these extremists, starting from opposite points, land on a common ground, where they are in perfect agreement as to the absurdity of an advertising campaign. One has disappointedly invested the subject with powers beyond its ability, while the other refuses to allow that it has any power whatsoever. Both have missed the middle of the road where advertising will be found to be an auxiliary, not the main moving force in promoting MORE business.

It should be clearly kept in mind that advertising is an invitation, not a compelling power; that power is the function of the salesman.

I allude to yet another type of the misguided, but only with the kindest feeling. This is the individual that concedes that there are many good methods of increasing revenue through advertising effort, but his friendship for his subject is purely academic, as he maintains that HIS affairs call for quite a different style of treatment. If he could only use the power of advertising as some distinguished exemplars use it, he will explain to you, he would like it ever so much, but his business is different, hence calls for a different treatment. The buggy builder is found in this company, but this is only a character study, not intended as a personality. As this has led us to the man I have had all the time in mind, it is a good place to begin the development of the idea that has prompted this simple talk on advertising, and its help in selling more buggies.

Do we start out with a well-defined idea of what advertising is? I am afraid not. I venture the opinion that if my auditors

were polled, the consensus would show that advertising was merely something published in the trade journal, which it is, of course, but that is only one view to take of the subject, and a very limited one at that.

If we go by the book we find that there are other meanings to guide us. Some of its functions are defined as making known by public notice; to inform; to notify; to give notice to; advise; to consider; to advert to; turn the mind to. You cannot mail a letter to a salesman that is not an advertising effort, if it is a business letter, in the sense of some one of the definitions quoted. You surely inform and notify him, advise with him, and no doubt often try to turn his mind to the considerations that would best promote the selling of more of your buggies. It seems plain, then, that about all of you are very consistent unacknowledged advertisers most every business day with results varying according to your psychological power and the use of the force of suggestion. Why not then, expand and amplify that force, working it as a double shift if necessary.

If you were an exceedingly prosperous tire maker, for instance, visions of riotous expense, if not extravagance would NOT picture themselves before your disturbed mental vision. There would be as your comforter that rich and rare curiosity the advertising or publicity manager, that "object of bigotry and virtue" to quote Mrs. Partington, who has become such an ornamental barnacle on the rich galleons of trade that no one feels like scraping him off; neither would you take fright at the elaborate devices of the "follow up," nor the mental sufferings of the followed-up, due to the systematic efforts of the individual characterized. You would have no chance to be tortured by reading the daily sermonettes that would be subsequently broadcasted to the waste baskets throughout the breadth of the land. Nothing like that is meant.

I believe that every buggy builder that pays this paper the compliment of his attention can organize right in his own office, with the facilities at present at command, a plan for enlightening the dealer as to the character of the work built that will be of great service in helping the salesman to increase the factory output, to your advantage and his great satisfaction.

This kind of selling endeavor is advertising directed to the self-interest through the medium of the eye, while salesmanship is using the ear of the dealer to gain the same end. An attractive personality is just as necessary in the advertisement as it is an important attribute of the salesman. The advertisers can extend the warm greeting and the happy smile as cheerily as the salesman, but it falls short of handing out a cigar, handing out a souvenir, or inviting to the cup that cheers.

The friendship of the dealer can be cemented by saying the right thing in a tactful way; this is also a buttress of salesmanship, but the advertisement is just as potent if the personality behind the effort is of the right stamp. There is no lever so good as friendship for lifting the volume of sales. It is a prime necessity because all the money is made out of our friends. Our enemies will not trade with us because they occupy the position of friends that do not understand us—yet.

This keeping in close touch with the dealer is important for yet another reason. It is the direct path to learning what the people want. What they want and what they need may be quite different, but your concern is to supply what they want. That is the real reason, I take it, for supplying such a crowd of styles, many of which return to plague you because you have not been happy in your attempt to gauge public taste.

On the charge of repetition, I repeat that advertising by itself cannot sell the goods. You may not know that even the

catalogue house has made that discovery. It is not germane to this paper to explain how and why. But advertising does fulfill the function of the Muezzin in eastern lands, it calls to prayer from a high place, it smooths the way for the salesman, that his action may be more fruitful. The mind of the dealer is placed in a state of receptivity, but following close on the trail of your letter must come the blandishments of your salesman. This is the problem whose answer gives the best and surest way to make the strongest appeal.

I believe it is not an unusual experience when the customer visits the factory, and is closeted with the head of the business, an uncommonly satisfactory order is signed up. This cannot be set down to the greater anxiety of the owner to make a sale over the effort of the equally enthusiastic salesman. Rather is it due, I think, to the clearer and more forceful presentation of the merits of the goods, due to the builder of them being saturated with the selling "points," and they are made as easily as the breath is inspired without taking thought.

Why should it not be so? Every separate job on his repository floor has first been built in his mind. It is the concrete expression of the functioning of his mind. His mind made manifest in wood and iron. There is not a detail that has escaped prayerful consideration. There is a good reason for every item in the construction, for every line in the design. It is quite out of the question to saturate the mind of the salesman with such a mass of details, to know it he would have had to live the life of the job as the maker of it did. It is not within the capacity of most of us to communicate all we know so we gloss over, forget, or think some of the details are not of consequence as selling features. So the outline is sketched for the salesman, and from it he must construct his argument just as the naturalist builds up his extinct specimen from its backbone as a sort of keel.

A great help in selling more work is the idea we get from service. We used to be faddists about system, then we got along to efficiency by slow stages, now we realize that the greatest of these three is service. The thought we get from this is that work is never sold until it is out of the dealer's hands, so we put the force of the organization to its trumps to help him do this. We co-operate by serving the dealer with all the talking points; we keep in close touch with him all the time, we tell him what HE doesn't know that we DO know about the work, but which no one has yet advised with him about, so he may put it in its best light.

After loading up our friend, our cleverest work comes in helping him to unload, that we may the sooner fill him up again. Advertising that can do this must be worth while. You put over the dealer the thought that you are truly his friend, and ideas once set in motion are unusually persistent. It would need the repetition of a different one by a competitor for a long time to displace the one already fixed in the mind. The campaign must be an effort in homeopathic doses.

The plan and scope of the work should have its foundation in announcements in journals that reach the eye of the dealer. This should not be a perfunctory duty to which you would attach about as much importance as ordering a gross of bolts, but should be a part of the matured plan. It COSTS money and money's worth should be gotten from it. If there was such a thing possible as that impossible thing a MUTUAL friend, this is what the journal would become. It would keep alive the tender recollections of your dealer-friend, and it would keep your personality before the enemy one day destined to be in the ranks of your friends. It is the best of all means for keeping your catalogue before the trade, but not in the perfunctory way you put the actual catalogue before it. I think you would be amused at yourself if you detected yourself in the act of trying to sell buggies on a catalogue description, or talking like the talk found in those precious documents. But you can take up style by style, and one at a time, talk about them just as you would if the dealer was sitting in front of you, save that you would do it with tabloid concentration and never for-

getting the illustration, which would be the text.

The builder himself can construct the most admirable advertisement, much better than the paid effort of the much touted advertisement writer, for he is onto the job in more than the slang sense of the phrase. He knows whereof he speaks. To be a success at it he has only to wean himself from the thought that he is writing an advertisement, but to keep in mind that what he is doing costs money and its purpose is to return it. Do this in homely, truthful way as you would talk, and it will hold the attention of your reader as a scandal story in the daily prints holds the attention of the ladies.

But this is only the support to the work that is to be done by the letter writing. You should blaze the trail of your salesman with your letters to the men he is to call upon. They should be very well posted individuals as to details of the work that the salesman is going to sell to them, if you have done your full duty. It makes a wonderful short cut to the salesman's final "How many?" thus putting him on his journey to the next man at a considerable reduction in the traveling expense account, and naturally increasing his selling effectiveness. Don't overlook the salesman either. Encourage his kicks about the work; smooth out his troubles, render service to him also; make him feel he is talking to a sympathetic listener when he is talking to the "house" in a complaining spirit, don't let antagonism spread its deadening influence or there is an end to all good effort.

Perhaps the work as outlined has an appalling look; and I suppose it will go a little hard at first. The usual business letter is such a trance-like affair of set phrases, that anything off the beaten track would be dignified by the name of composition, I suppose, calling for fine writing, whereas the only thing indicated, as the doctors say, is simple common sense statement, the simpler the more effective, easily understood, hence fully believed in. It should really be a talk, not a letter at all. You never have misgivings when you have to meet the customer in person, therefore give him an "absent treatment" along the same lines. Don't scratch your head for words of "learned length and thundering sound" as Goldsmith's teacher did, but just talk in your every day natural way, because then you are yourself and at your best. Fine writing so-called generally results in such a jumble of words that the suspicion is present that the writer may have mistaken a box of cascabels for the dictionary and gotten a looseness of dialect at the expense of a clear, homespun statement.

This almost daily duty is an easy matter when taken in installments, dictated to the stenographer just as you would talk to the superintendent in discussing practical details. The result of the dictation can be sand-papered afterwards, if you prefer, but the rough-hewn first draft will the more likely have the true lines, and better reach the understanding and sympathy of your correspondent.

There is nothing in all this that calls for any strain or stress on the office equipment, or any material extra expense. If your stenographer is of the feminine gender, and has an endowment of twelve-dollar-a-week brains and a disposition to help out, she can relieve your memory of most of the detail, becoming your supplementary right hand.

As every man works out his salvation on a plan that is a special endowment from his Creator, it would savor too much of doing things by rote to go into details as to how these talks should be conducted, and they would lose any virility they ought to possess. Not any two builders would describe the merits of an identical job in the same terms, or there would be no such thing as originality of statement.

Nowadays the tendency is to abandon the exclamatory statement for the explanatory, because customers want to be shown. They seem all to be born in Missouri. Although quality of product, price considered, is the touchstone, it is the constant bearing down on price that is the trying thing. It can be shown by these office letters to the customers better than in any other way, because personal and friendly in tone, that demand for

goods for less and less money leads directly to depreciation of product which finally fails to satisfy the user of them.

I suppose it may have been marked for reference that I bear down rather hard on the power of direct, simple statement. I do so because it has a psychologic force that is at last coming to be better understood in trade. It is also being more generally put to use. There are still some who believe that suggestion is an uncanny force savoring of the occult. But the only thing supernatural about it is the indolence of business thought in grasping its possibilities. It is a power I am trying to exercise this minute, that is to implant in the minds of my listeners an idea, and to do it with enough skill to disarm opposing ideas, and to give to those ideas a tendency to realize themselves in action. Every salesman who has proved to be of worth does this with or without consciousness. He tried to inspire conviction regarding the buggies he is selling, and to transform that into action. The advertising campaign from the office should be along the same lines. I would like to say more about the psy-

chology of suggestion if it could be done appropriately. It is something of vast importance to all men of affairs, to which their attention will be compelled in a little while from force of events. The very clever business men are already in the waking state, as may be seen in the scientific management of factories for which Mr. R. W. Taylor stands sponsor. His whole plan is the psychologic power of suggestion. The details are mere scenery.

The best advice I have the privilege of suggesting in this little talk is to make full and free use of the direct command, the direct statement. Avoid the apologetic phrase, but suggest to your correspondent what you want him to apprehend in no uncertain, or involved phrase, and he will almost automatically follow your lead. Apply it to your salesman, too.

I hope I have been of service to my listeners in presenting my idea of what is a quite sure course to pursue if a true answer is wanted to the question. Can MORE Buggies Be Sold By Advertising?

THE FUTURE OF THE CARRIAGE BUSINESS.

P. R. Doherty, Flint, Mich.



WHEN Mr. McLear requested me to prepare a five-minute paper to be read to this convention, naturally I felt very much flattered to be considered. After carefully considering the matter, it occurred to me that the reading of a paper in this convention on any subject other than the one in which we are all, or should be, vitally interested would be presuming on your time.

We have come here to see and learn. Every good business

man in making an investment gives careful thought to the probable returns from that investment. He comes here for a few days not only expecting to enjoy himself by relaxation from the regular routine of his daily pursuits, but also to gather new ideas that will prove beneficial to his business welfare in the future. Information gained from associations of this kind should be most valuable to him.

The subject in hand whether it will begin to have justice done to it or not should certainly strike a responsive chord and set ourselves to thinking. The question of the carriage industry's future has presented itself, no doubt, many times to each of us. It is far reaching in its scope and its future, of course, lies with us and conditions.

We have watched its growth with utmost pride; noted with keen interest its losing hold in some sections, asserting itself boldly in others, and planning wisely for its continuance in the years to follow. In predicting its future, we must take cognizance of its past. The familiar statement that "Westward the course of empire takes its way," seems in a measure applicable to the industry we are so glad to be allied with.

This topic to be handled satisfactorily to all concerned should be dealt with in the aggregate, not what is Paterson's, Durant-Dort's or many others' future, but the future of the industry itself. To my mind its future spells continued prosperity. Possibly it has reached its zenith and may in some sections be giving way to another power due to conditions over which we have no control. However, the South, the West, the Southwest and the Northwest will, we think, be fruitful soil for the dissemination of our product. The assurance we have that the

improvements in these sections will be pushed with vigor, should inspire us with the feeling that our future is glorious.

To illustrate this point more clearly, we have but to notice the increasing volume in the factories nearest to these places of vehicle consumption. These sections cover immense areas, farms are increasing amazingly, highways are being opened, old ones being improved, and the inevitable result therefore must be new fields for the goods we are marketing. Has not this been the history in the past, and why will not history repeat itself?

I do not think the motor car will radically upset the repetition of history in these sections, because the farmer is a cautious and a natural man and will therefore creep before he walks. These fields will be opened up gradually and conservatively and therefore the horse-drawn vehicle will precede the automobile just as it has done in the development of this country, in the past.

Statistics in a discourse are burdensome because they generally present an array of figures that are beyond quick comprehension. But please pardon the mentioning of two. I think you will be agreeably surprised if you are not already familiar with them. The product of sixteen axle companies in the vehicle industry for 1909 totalled approximately over 1,100,000 sets, while for last year the combined products of these same companies exceeded 1,250,000 sets. Possibly not all of these were put into the finished vehicle, but isn't it a good indication that we are healthy at the present time?

Suppose by chance for some reason or other the sections enumerated above do not keep our factories busy in the future, what then? Let us see. To the South of us is a hemisphere that has a wonderful future and up to this time the vehicle industry here has made practically no headway there with its product. By nature the United States is the logical source to supply the South American countries with horse-drawn vehicles and it will not be a difficult task to transfer part of our product there if we reach the time at home when the industry is on the wane. Let us hope, however, we will continue to expand here and supply the big countries to the south of us from now on before a foreign country gets a foothold.

Don't you think from the vague outline of the foregoing that our future is bright? The history of the industry's past is an inspiration. Surely its present is reassuring, then why not stand together and put forth untiring efforts to make its future a most welcome heritage to generations yet unborn?

THE BANQUET

MARLBOROUGH-BLENHEIM, THURSDAY EVENING

President Charles J. Richter acted as toastmaster at the annual banquet held at the Marlborough-Blenheim Hotel, Thursday evening, September 28. A toast to "The President of the United States—William Howard Taft," was drank, after which the toastmaster introduced the Hon. Leslie M. Shaw, former cabinet officer, who spoke as follows:

ADDRESS OF HON. LESLIE M. SHAW.

Mr. SHAW: Mr. Toastmaster, Ladies and Gentlemen: I was very glad, indeed, when I discovered that I was going to be permitted to begin my speech thus. I was very glad to be invited to talk to you people who make carriages and make money. I wish I had some of both. It is a great pleasure to be kindly received when one is not in office. When one is in office he is always kindly received in an audience, and unkindly usually on the side. I wish I knew something about carriages so that I could talk to you upon that subject, but I do not.

While talking with members of your association I have heard much complaint of industrial conditions. Several have asked the cause. Any one can guess. I submit a brief summary of my guess.

Present conditions are not the result of a cause, but the result of causes. But first let me remind you that from the beginning of our national history no man ever walked the streets in vain for work; no man ever returned at night to find his wife in rags and his children hungry because of dishonesty in public office, or because of late or early frosts, because of the boll-weevil or grasshoppers, because of earthquakes or cyclones, or from failure of crops, but millions have suffered the loss of employment, which is worse than any of the plagues of Egypt, aye, worse than all the plagues of Egypt, because of unwise legislation at Washington. We have had panics brought on through recklessness in business, but neither the panic of 1893 or 1907 lasted three months. A financial panic, like any other panic, is the result of sudden fear, and is soon ended—all but the effect. If at this time we should see smoke oozing from the floor or ceiling, if we should smell smoke, or even think we smelled smoke, there would be a panic. But however bad the panic might be, it would be over in thirty minutes. The conflagration might last all night. Financial panics cease with the scare. Industrial stagnation ceases only when the remedy is applied. Under our financial system panics are possible, but nothing ever has produced and nothing can produce industrial stagnation except ill-advised legislation. This country can stand any amount of dishonesty, but it surrenders when the novice enters legislative halls.

This year of grace should have rivaled in prosperity any previous year in our history. There was never an effect without a cause, and every cause produces an effect. Business is no respecter of parties. Bad legislation, even threats of bad legislation, and promises of radical if not revolutionary economic policies, will bring disaster as quickly when one party is nominally in control as when the other is actually in control.

Ex-Congressman McClary recently used this illustration: The building in which we are here assembled was once the conception of a human mind. Assume that the plans and details have been prepared, the contract awarded, and to-morrow the cornerstone is to be laid. Sitting in his library the builder is informed that the all-wise lawmaker has had his attention attracted and his sympathies aroused because of sorrows entailed through the operation of the laws of gravitation. It has been brought to his attention that even this law does not always

work satisfactorily to us. It has been pointed out to him that men fall down wells and mining shafts, and off buildings, and things fall upon them, and that their wives are left widows, their children orphans, and all destitute and, he is considering an amendment to the great law. McClary asks: "Will the cornerstone be laid to-morrow or ever?" He might have added that the first session of the Sixty-first Congress witnessed the introduction of thirty thousand new laws, and at the adjournment of that same Congress the President was complimented by well-nigh every newspaper in the United States for having passed two hundred new laws at one session. Mark you, the President and not Congress was given credit for their passage. At that rate in ten years we shall have two thousand more laws than we now have, and then our liberties ought to be reasonably secure. He might also have added that nearly every constitutional provision on which this government rests as certainly as creation rests on the law of gravitation, is being assailed and revolutionary amendments proposed. God can be relied upon to let the law of gravitation stand, but no man can predict what Washington will do, or what the people when excited will demand.

Is it any wonder that business is unsettled? The American people have made politics an industry. In several large cities during the last year they have made from one to three attempts, some successful and some unsuccessful, at the recall of prominent public officials. Many states have been rent from seam to gusset by referendum and by primaries. This state is not an exception, and Philadelphia is an illustration.

Without discussing the relative merits of the policy of protection, and the policy of free trade, I feel safe in the assertion that the American people can stand any kind of a tariff law if it can be made secure and perpetual. That it can not stand perpetual or even prolonged tariff agitation, ought to be apparent at this time. Business, if given sufficient time, will adjust itself to any condition except a condition of uncertainty.

Once in about so often the American people go Democratic on the tariff question, but this is the first time in the history of the country when the Republican party has gone Democratic on the tariff question. Germany, despite her temporary financial trouble incident to the war scare, is the most prosperous country on the map. Her tariff policy is permanent and her school children are taught to voice it in this language: "Germany works for all the world, but nobody works for Germany but Germans." If her tariff was gauged by the difference in the cost of production, she would need no protective tariff—certainly none against the United States. Her scale of wages is about the same as other European countries, and much less than here. She knows no standard of protection but a protection that protects. Measured by the difference in the cost of production, her tariffs are twenty-five per cent higher than any this country ever had.

There are many strong arguments in favor of a tariff for revenue only, which is but another name for free trade. There are many arguments in favor of protection that protects, and I suppose there are some arguments in favor of a tariff that measures the difference in the cost of production, which is not protection but competition. It would be out of place for me to discuss either or all. I do not think it out of place, however, to urge this body of capital users, labor employers and producers, to insist upon some stable economic policy. The idea of adjusting a tariff to meet changed business conditions is the rankest nonsense. Business will adjust itself to any new tariff law, while any change in tariff law will disturb business. A stable imper-

fection is better, therefore, than revolutionary promises. It is not the known peril that frightens men, but the unknown. Armies do not stampede in the heat of actual engagement, but at impending battle with unknown numbers.

Fortunately, I think, there is every assurance that the present tariff law will remain unchanged until past March 4, 1913. The President has vetoed two tariff bills, giving as his reason that when the tariff commission reports he will be in possession of the maximum available human wisdom on the subject, and that the bills as passed evidence the maximum of human foolishness.

In his veto message he also says that the day for Chinese tariff walls and rates which more than measure the difference in the cost of production at home and abroad are gone. In effect, he says that the outrages heretofore perpetrated upon the American people by the Republican party shall henceforth cease. Early in December next, it may be safely assumed, he will inform Congress what it ought to do, and it may also be safely assumed that Congress won't do it. While Congress has done many things, about the only thing which it has never done is to adopt the report of a commission. I appeal to the record to substantiate this statement. It does not adopt reports of commissions of its own creation even, and the tariff commission it never expressly authorized. Like many other commissions and boards, it is a creature of the Executive. It is composed of five men inexperienced in any line of business, two free traders, two competitionists, and one protectionist. When a Republican President asks a strongly Democratic Congress to adopt a report of his commission, not theirs, I fancy he will be told that they will see him in regions unexplored before they pull his chestnuts out of the fire, justify his veto, or admit by act of deed his accusations that a Democratic Congress does not know enough to formulate a tariff bill, notwithstanding the constitutional provision that all revenue bills shall originate in the House. Suppose he then appeals to the insurgents. They can safely say "We are entirely at sea as to our own position on any economic question, but of one thing, and one thing only, are we certain—whatever you are for we are against." Then he may appeal to the few remaining regulars. These are likely to remind him that the Republican policy of protection which has been in operations for so many years, and which he now renounces, is a policy for which they are in a large measure responsible and a policy in which they have always believed, and in which they now believe more strongly than ever in their lives. They will tell him that they love him, and, barring William McKinley, no lovelier character ever occupied that high position, but I believe they will decline to give a tariff for competition as distinguished from a tariff for protection more than nominal support. Unfortunately the only political friends which the President has differ radically with him on the tariff question, however strenuously they deny the charge, while those who have heretofore advocated what he recommends are the insurgents who now openly oppose him.

I think we are safe in assuming that there will be nothing more than talk for at least eighteen months. An appeal to courage is therefore in order. Let the heathen rage and Wall Street imagine vain things; but you gentlemen, go home, turn on the steam and produce all you are certain of selling. I would not enlarge the factory until the people quit politics as an industry and return to business.

THE TOASTMASTER: The next speaker is a gentleman who is well known to most of us and who has always taken a very deep interest in our affairs, and who is one of our oldest associate members.

I have the pleasure of introducing to you the Hon. Franklin Murphy, former governor of this State.

ADDRESS OF HON. FRANKLIN MURPHY.

I am very glad to be with you to-night and to renew some of my old friendships and my old acquaintanceships in this association. There was a time when you never met that I was not

with you, but that has not been for many years. Circumstances have been such that during recent years I have not been able to be present at your meetings. I have come partly because I wanted to come and partly because I have been invited to say a word to you, and that did not make me in a hurry to accept the invitation, because I have never had much of an opinion of my own speeches.

Now, I have been somewhat in trouble as to just what to say to you, and the speech of our distinguished friend, who says he is from Iowa—he is not from Iowa very recently, I take it, after that speech. (Laughter). His speech has not helped me any. Most of the things that he says a good many of us will agree with, but we are glad to have him here, but I am sorry, and I think you are sorry, after that speech of his, that he has left the vocation of the statesman and gone into that of a banker. I do not mean to say it is going down, yet in his case and in our case I feel as though it is coming down. The more men we have in this country like Secretary Shaw, who meditates and gives his friends the benefit of his meditations with a courage that permits absolute frankness, the better for this country. (Applause.)

I think we may say a word for the working man in this presence. There is no man that I know is surer of his manhood than the man who learns a trade. No man's future is more certain on the whole than the man who learns a trade and learns it. If he has a technical education, so much the better. The ordinary workman goes out and takes what he can get. The man with the trade does better. The man with the technical education does even better than he, but they are all workmen, and the spirit of this association is the spirit of work.

I want to try and lodge in your minds the spirit that comes from the possession of that somewhat illusive and indefinable thing that we call the ideal. The ordinary man goes about his work and accomplishes a certain amount. The more he is educated and trained and the finer his sentiments towards his work the more he accomplishes. The man with an ideal strives after something more than material success, not exactly for dollars. Dollars are incidental to it, but it is the spirit of success that possesses him, and just so far as the spirit of the ideal takes hold of him and guides him and leads him, just so far is he a better workman and a better citizen. He is a workman, and this association, if I understand it, stands for just that.

The toastmaster then introduced Hon. Walter E. Edge, member of the New Jersey legislature, who spoke for a few minutes.

The next and final address was made by the Rev. W. Warren Giles, of East Orange, N. J., who spoke as follows:

ADDRESS OF REV. W. WARREN GILES.

Mr. Toastmaster, Ladies and Gentlemen: I am sure you will not misunderstand me if I take you all into my confidence to-night and very humbly confess my embarrassment in being put in competition with these splendid artists who have already favored us with speeches. I also ought to confess that I am here as a proxy. I think my pride might probably get the better of my judgment if I did not admit that. I received a very frank letter from the committee of pulpit supply, (Laughter) and the gentleman who wrote it said: "As a matter of fact we tried to get somebody else," (Laughter) "hence this late invitation. But will you very graciously accept?" Of course, being the servant of humanity (Laughter) by instinct and profession I could not decline such an appeal as that. (Laughter.)

I must say, gentlemen, I have been greatly benefited by coming here to-night. I have enjoyed these speeches. I am so glad to have heard Secretary Shaw. I will never forget that polished dome of thought of his. It is certainly built for meditation. (Laughter.) I hope, Secretary, that you will never, never apologize for having a bald head. (Laughter.) When I look at you I realize more and more that the good Lord never puts marble tops on cheap furniture. (Laughter and applause.) And I am also very, very much pleased to hear from my good friend, ex-Governor Murphy. (Applause.) In the first place I got a new

conception of the ideal from him in the matter of work and I also got a new conception of the length of four minutes and a half. (Laughter.)

I was also very much electrified by the speech of the representative in the legislature from this district, the Hon. Mr. Edge. I was astonished when he expressed the belief that it would be a good thing for the country if every legislature would adjourn for five years. Do you know, I couldn't make up my mind whether he had the legislature of New Jersey in mind or the one of New York. (Laughter.) In New York, you know, a year ago the peculiarity of the situation was this, that everybody in the Senate and Assembly called everybody else a liar and a thief and nobody made a mistake. (Laughter.)

I sat on this esplanade this afternoon and a friend of mine told a good story. It was new. (Laughter.) He said some time ago two men in Chicago, or rather in some remote part of Indiana, who had accumulated \$5,000, made up their minds to increase it materially, so one was delegated to go to New York and invest it in Wall Street. After two or three weeks he wrote to his friend and said, "The \$5,000 has already netted \$25,000. What do you think of that?" The friend could not wait to write so he sent the following telegram at once: "God is good." (Laughter.) Then two weeks later the man in New York made the announcement that every dollar of the \$5,000 had been wiped out. Then he got this telegram: "Good God." (Laughter.)

Now, as I have sat here to-night listening to these gentlemen of high finance I have alternated between those two expressions, "God is good," and "Good God."

You can not imagine how different it is for poor fellows like myself to come to a conclusion that is satisfactorily intelligent when the doctors disagree as they have here to-night. (Laughter.) I want to tell you a little chapter out of my own financial experience and you will all smile, because it is so amusing. It didn't amuse me at the time. Secretary Shaw, on the 14th of December, 1909—I can not forget the date—one Tuesday night I picked up the Evening Post—you all know what the Evening Post is—(Laughter.) and I saw the announcement that "owing to the stringency of the times the directors of the Bowery Savings Bank beg leave to announce that the rate of interest instead of being 4 per cent will be reduced to 3½ per cent. Well I had been accustomed to read so many Misereries of that kind from institutions where I have committed my enormous accumulations that I stood the shock splendidly (Laughter.) but I looked on down on the same page—mark you, not on a sensational journal, but the staid Evening Post—and right on the front page I read this: "The directors of the First National Bank beg leave to announce that in addition to the regular stock dividends of 32 per cent they add a supplemental dividend of 8 per cent," and say, do you know that I had a great light, a great light fell upon me as to the difference between big and little business, (Laughter) as to the difference between the man who knows how to do the thing, as you fellows do here to-night, and the poor little victim of circumstances like myself, who has kind of gathered the crumbs from the rear end of the financial table, and do you know I was so struck with the situation that I thought I would find out something about the First National Bank, and it is such an interesting story, and as it won't take more than a couple of minutes to tell it, I will tell it to you just to show you the gulf that exists between Lazarus, whether he wears his collar buttoned behind or whatsoever way he wears it, and Dives, and as to the reason why the First National Bank could pay a dividend of 40 per cent on ten millions of capitalization.

The First National Bank in 1902 was a very conservative institution. It had a capitalization of \$500,000 on which it paid a dividend of 100 per cent. That is pretty good, isn't it, dollar for dollar? Then the broad idea of increasing the capital was conceived and it was jumped from \$500,000 to \$10,000,000. The first year, I think, the dividend was 20 per cent, and then it rose to 23 per cent and then 25 per cent and then to 32 per cent, and

then two years ago a supplemental dividend of 8 per cent, making 40. That is \$10,000,000 earned \$4,000,000 in dividends. Quite a difference, wasn't it, between my little hundred dollars earning the enormous interest of \$3.50 (Laughter.) and the \$10,000,000 earning \$4,000,000? But that is nothing compared to the fairy tale I am now going to tell you. When that change of stock was made from \$500,000 to \$10,000,000, every man who held one dollar of the original stock got \$19 for it. That is a little jump of 1,900 per cent, and then in addition to that he got a little dividend of 40 per cent.

Do you wonder that we poor little fellows who do not understand political economy and who are not skilled in high finance, who know nothing of the big business, except to pay 8½ cents a pound for sugar occasionally, and who get 3½ per cent or 4 per cent on our money from the Bowery Savings Bank and then are notified that owing to the stringency of the times the interest rate is cut, and right on the same page read about a bank that disburses 40 per cent, ask ourselves hard questions, get perplexed, that we say sometimes things that are blue, especially when the doctors disagree? But I want to tell you, gentlemen, I don't feel hard, I am satisfied with the 3½ per cent because I have to be. (Laughter.)

I want to tell you in a serious good-night word that in spite of my perplexed condition of mind regarding these things, although my Christian mind can not at times approve of some of their methods, and I have misgivings at times of some of the ways in which they build up their business, I believe absolutely in the future of this country and in the integrity of its manhood. I want to tell you that if there is anything more conspicuous about the American people to-day than the honesty of the great middle class it is the fairness of the women, as sure as you live. (Laughter and applause.) In spite of all the pessimistic wails that are uttered from ocean to ocean, and in spite of the things that the secretary called attention to in his speech to-night, there is one thing that stands out above all, and that is the middle class of people are honest, perfectly honest. The banks and department stores, the retail interests of the country are honestly conducted. Go to Wanamaker's in New York and they will make any kind of a deal with you. If you buy something you don't like, take it back, and if you don't want anything they have they will give you the money back, or they will give you credit or you can take something else for it. Of course John Wanamaker is not doing business for his health—(Laughter.) but still these institutions are all perfectly honest.

Just as the Hon. Mr. Edge said—and it was a good point, too—not even the economic miseries of the people who do not know any more than to get 3½ per cent on their money, not the duplicity of the politicians can destroy the integrity or to any great degree the prosperity of the country, nor prevent the country from fulfilling its great destiny. Do you know every time I look at our flag I just feel as though God had given me the inspiration of a prophet, whether He had His wisdom or not?

Just look at the difference twenty years has made. Twenty years ago if the United States wanted anything of Japan and Japan balked a little, Secretary So-and-So would telegraph to Captain So-and-So to sail up the harbor of Tokio and make a demonstration. Do you hear of anybody sailing into the harbor of Tokio to-day? I guess not, gentlemen. Japan is awake, awake, one of the first rate powers. China is as different to-day from what it was twenty-five years ago as day is from night, and when you come down to the smaller powers, believe me when I tell you to-night even Afghanistan has a constitution. Just think of it! Afghanistan with a constitution. Come over into Turkey. To-night you could publish the New York Journal in Constantinople, and you could not publish any kind of a newspaper there twenty years ago. The old sultan, Abdul Hamid, who has been sent to Salonica, retired with only eleven of his lady companions. I think they were pretty generous with him, I certainly do. (Laughter.) If I had been on the Young Turk's committee he wouldn't have fared as well. And when

you come into Germany, what do you find to-night? Have you any conception of the progress of Germany? I was tremendously impressed with what the secretary said of Germany to-night. I was not familiar with the aspect of economic life in Germany, but I want to tell you of an occurrence in Berlin. Two strangers were walking up the Unter den Linden and were discussing the vagaries of the German emperor. One said to the other, "Do you know, I think the German emperor is a fool," and he mentioned the kind, (Laughter) and the other said, "Oh, I don't know." Just then a German officer stepped up, and laying his hands upon their shoulders, said: "Mine friend, come mit me by the police station." "Why, what do you mean?" "Why, you called mine emperor a fool, you come mit me by the police station," They saw they were in a tight place, and with a brilliant idea striking him, he turned around and said, "My dear sir, you are laboring under a misapprehension, I was discussing the emperor of Russia." The officer looked puzzled for a minute, and then said, "Mine friend, that won't wash, that won't wash; there is only one of them kind of fool emperors in Europe and we have got him. Come mit me by the police station." (Laughter.) When you come to England you will find the House of Lords reduced at last to such a sphere that every one of them will be able to become a golf expert because they haven't anything else to do. I should like to give my definition of some of the things that have happened here—my very immature conception of the progress of this country, but I am not going to commit myself.

Now, it is characteristic of the part of the country where I come from—and I want to say confidentially that I was born in New York—that part of the country where Mr. Morgan and other inconspicuous gentlemen live—that the only thing that does not change is the skyline and the two rivers. (Laughter.) I can not identify anything as being permanent there except just the sky and the two rivers. (Laughter.) Oh, the change there is awful. (Laughter.) Do you know that when a man makes money in New York and wants to be fashionable he moves northeast, and when he makes money and wants to be democratic he moves northwest, and if he does not make money he moves from the one side of the elevated railway, when they raise the

rent, to the other side, and if he loses money, gentlemen, what does he do? Why he finds himself a place out in the suburbs where I live. (Laughter.) Of course, this has no bearing understand, on the difference between $3\frac{1}{2}$ per cent and 40 per cent—no bearing whatever. That is simply an observation that I must make every time I stumble across the river into the great city.

Now, in bidding you good-night, gentlemen, just a serious word. Let me thank you with all my heart for this very great honor. Apropos of the serious things that have been said here to-night, I asked a friend of mine the other day—he has just returned from Europe—what had been the most impressive thing he saw. He said, "It was the inscription, 'All that pleases is but for a moment; all that troubles is but for a moment; that only is important which is eternal.'" I believe, as Governor Murphy has intimated here to-night, that the men who founded this republic—Jefferson and Adams and Hamilton—founded it on principles that were eternal. The nation has a destiny, and it must fulfill it, and in the name of our great God and Father to-night "All that pleases is but for a moment; all that troubles is but for a moment; that only which is important will be eternal." That is the way we want to be. I thank you very much.

INTERESTING AND TIMELY.

It is curious to find technical matter relating to woodworking machinery, and the accidents that follow from its unguarded use issued by an insurance corporation, but the accident and liability department of the Aetna is responsible for this illustrated book of 199 pages of text.

Many of the illustrations are familiar, also much of the matter in different form, but none the less, it is a book well worth the attention of all who "monkey with the buzz-saw," using the slang to cover the whole ground. Mr. Van Schaack has done the work of a faithful compiler, and it has been thorough. We presume the book will be mailed upon application. We might say that as a rule the most desirable information comes from the efforts of special pleaders, so this book ought not to be overlooked by those at all interested.



GROUP OF LADIES, C. B. N. A. CONVENTION, ATLANTIC CITY, N. J., 1912.

BUGGY BUILDERS REGISTERED AT ATLANTIC CITY.

Rockhill (S. C.) Buggy Co.—J. W. Anderson, C. S. McCrory, J. G. Anderson.
 Flannagan Buggy Co., John, Greenville, N. C.—E. G. Flannagan.
 Franklin Buggy Co., Barnesville, Ga.—A. H. S. Franklin.
 Ligonier (Ind.) Buggy Co.—Sol. Henoch.
 Rex Buggy Co., Connersville, Ind.—W. O. Hull, C. C. Hull.
 Hess, D. T. Quarryville, Pa.—D. T. Hess, D. T. Hess, Jr.
 Hackenhauer Works, C., Muncie, Ind.—C. C. Hackenhauer and wife.
 Hayford & Sons, Newton, N. H.—J. E. Hayford.
 Hollinger, M. B., Neffsville, Pa.
 Durham (N. C.) Buggy Co.—W. J. O'Brien.
 Parry Mfg. Co., Indianapolis, Ind.—A. M. Parry and wife, W. E. Maxwell and wife, T. H. Parry and wife.
 Wrenn & Sons, Norfolk, Va.—M. O. Shaughnessy, C. O. Wrenn and wife.
 Summers Buggy Co., Barnesville, Ga.—Riley Summers, G. L. Summers.
 Ames Co., F. A., Owensburg, Ky.—J. T. Sandwich.
 Sechler Implement & Carriage Co., D. M., Moline, Ill.—T. M. Sechler, W. J. Davis.
 Durant-Dort Carriage Co., Flint, Mich.—D. M. Averill and wife, Jas. T. Wilson.
 John Arthur & Son, Fork, Bolton Co., Md.—C. E. Arthur.
 Anchor Buggy Co., Cincinnati, O.—Miss Genevieve Brunsman, A. A. Geiss and wife, Miss May Becker.
 Brockway, W. N., Homer, N. Y.—Mrs. Leflie Brockway, H. S. Brockway, G. A. Brockway.
 Boshers Sons, R. H., Richmond, Va.—Charles G. Boshers.
 Norman Buggy Co., Griffin, Ga.—Mrs. Douglas Boyd, W. G. Norman.
 Brown Carriage Works, Mifflinsburg, Pa.—R. F. Brown.
 Brown Carriage Co., Cincinnati, O.—Geo. S. Brown.
 Blotkamp, John, Baltimore, Md.
 Fulton & Walker Co., Philadelphia, Pa.—C. G. Carson, Miss H. Fields, Miss C. Krother.
 Regal Buggy Co., St. Louis, Mo.—Jas D. Cathey and wife.
 Hercules Buggy Co., Evansville, Ind.—J. D. Craft and wife, W. H. McCurdy and wife, W. R. Scott, Miss Thompson.
 Gray & Sons, Wm., Campbell Co., Chatham, Ont.—Manson Campbell, Robert Gray.
 Gram Motor Truck Co., Lima, O.—John Dougherty, John Kane.
 Enterline Coach Works, John G., Rhenus, Pa.—John G. Enterline.
 Mrs. Anne Enterline, Mrs. Susan Wolgemuth.
 Columbus (O.) Buggy Co.—J. F. Firestone and wife.
 Goodville (Pa.) Coach Works—George F. Cohen.
 Gerstenslager Co., Wooster, O.—Geo. Gerstenslager.
 Hopp Carriage Co., A. A., Mifflinsburg, Pa.—A. A. Hopp and wife.
 Enterprise Carriage Co., Tarboro, N. C.—Thad. Hussey and wife.
 Herring Buggy Co., Mansfield, O.—D. Herring.
 Cortland (N.Y.) Carriage & Motor Co.—J. K. Httple.
 Holcker Bros. Buggy Co., Crestline, O.—Chas. Holcker.
 Houghton Sulky Co., Marion, O.—W. H. Houghton.
 Hardy Buggy Co., Paducah, Ky.—W. T. Hardy.
 Hackney Wagon Co., Wilson, N. C.—W. N. Hackney.
 Goodville (Pa.) Coach Works—N. Kramer.
 Laderer Carriage Factory, N. C., Evans City, Pa.—A. F. Laderer and wife.
 Colfax Mfg. Co., South Bend, Ind.—C. A. Lancaster and wife.
 Lancaster & Co., J. A., Merrimac, Mass.—Mrs. Alice Lancaster.
 Leicht, H. S., Elizabethtown, Pa.—A. R. Leicht.
 Manley Carriage Co., J. D., St. Louis, Mo.—J. D. Manley and wife.
 Auburn Wagon Co., Martinsburg, W. Va.—R. L. Muir.
 McIntyre Co., W. H., Auburn, Ind.—W. H. McIntyre and wife.
 Norman Buggy Co., Griffin, Ga.—E. G. Merck.
 Arthur & Son., Bel Air, Md.—J. Frank MacLean.
 Hull Vehicle Mfg. Co., Savannah, Ga.—Earl J. McCone.
 Hughes Buggy Co., Lynchburg, Va.—J. B. Stovall.
 Henney Buggy Co., Freeport, Ill.—M. A. Steele.
 Empire Carriage Co., Cincinnati, O.—Jason Schneider.
 Staud Carriage Factory, Pittsburg, Pa.—J. P. Staud and wife.
 Montgomery-Ward Co., Chicago, Ill.—J. H. Votel.
 Angel Vehicle Co., Middleburg, Md.—R. K. Angel.
 Bell Carriage Co., Washington, Ia.—Frank Bell and wife.
 Burg Carriage Co., Dallas City, Ia.—Homer S. Burg.
 Burns Bros. Havre de Grace, Md.—W. E. Burns and wife.
 Edwards, Warren L., Elmer, N. J.—F. M. Bacon, W. L. Edwards, O. N. Gilson.
 Strasburg (Pa.) Coach Works—T. L. Strasburg and wife.
 Blehl's Carriage & Wagon Works—Reading, Pa.—G. W. Blehl, W. H. Eisenbrow.
 Parker Mfg. Co., Suffolk, Va.—Miss N. Brett, B. C. Parker.
 Corbitt Buggy Co., Henderson, N. C.—R. J. Corbitt.
 Taylor-Cannady Buggy Co., Oxford, N. C.—N. H. Cannady.
 Conboy Carriage Co., Toronto, Can.—D. Conboy and wife, Miss E. J. Conboy.
 Joseph McShell, Philadelphia, Pa.—J. F. Cleary and wife.
 John Cathcart, Wilmington, Del.
 Dewald, J. G., Pottsville, Pa.
 Derham, J. J., Philadelphia, Pa.
 Delker Bros., Henderson, Ky.—F. H. Delker.
 Paterson Co., W. A., Flint, Mich.—P. R. Doherty.
 Frank, W. H., New Rochelle, N. Y.—D. E. DeWitt, W. H. Frank.
 Morton, Geo. C., Wilmington, Del.—A. Dickinson.
 Down, Thos. C., Wilmington, Del.
 Dalrymple, Evans, Easton, Pa.
 Eckhart Carriage Co., Auburn, Ind.—Chas. Eckhart and wife.
 Fair Carriage Works, C. A., Harrisburg, Pa.—C. A. Fair.
 Staver Carriage Co., Chicago, Ill.—C. W. France, J. W. Henney, Jr.
 Moon Carriage Co., St. Louis, Mo.—L. A. Geserich, A. F. Maberly.
 Grof Coach Works, West Quarryville, Pa.—A. Grof.
 Gass, Adam, and wife, Brandywine, Pa.
 Giblin, Augustus, Providence, R. I.
 Koch Bros. Co., New Waterford, O.—J. A. Gunder, J. H. Koch, John Koch, Wm. Koch, Geo. J. Koch.
 Moyer, H. A., Syracuse, N. Y.—F. H. Gowen.
 Hale Buggy Co., Anniston, Ala.—D. P. Hale.
 Hackney Bros., Wilson, N. C.—Geo. Hackney, Thos. Hackney.
 Hallman, D. H., Norristown, Pa.
 Boyertown (Pa.) Carriage Works—F. H. Hartman and wife, Miss Vesta Swavely.
 Herby & Sons, J., Jamestown, N. Y.—F. C. Herby.
 Heyman & Sons, J. G., Noblesville, Ind.—Geo. R. Heyman.
 Morton, Geo. C., Wilmington, Del.—S. H. Hardester.
 Hayes Livry Co., Philadelphia, Pa.—John Hayes.
 Keystone Wagon Works, Reading, Pa.—C. C. Hayes.

Johnston Co., Chas. Newburg, N. Y.—W. Chas. Johnston.
 Kaiser Buggy Co., Kenton, O.—W. H. Kaiser.
 Enterprise Carriage Co., Miamisburg, O.—Wm. Kaufman and wife, Wm. Kauffman, Jr., Miss Fannie Kauffman.
 Kirk, J. A., Davenport, Ia.
 Schick Co., Herman L., Elizabethtown, N. J.—Fred Kraefft.
 Goldsboro, (N. C.) Carriage Co.—D. R. Kornegay.
 Stewart Vehicle Co., Martinsburg, W. Va.—W. P. Lippincott.
 Rattermann & Luth, Cincinnati, O.—Theo. Luth.
 Sturtevant-Larrabee Co., Binghamton, N. Y.—H. C. Larrabee, Jas. Larrabee.
 Miller, Jacob, Palmyra, Pa.
 Moore & McIntosh Carriage Co., Alexandria, Ont.—John McIntosh.
 Martin, Wm. W., Pottsville, Pa.
 Morton, Geo. C., Wilmington, Del.
 Mayer, M. J., Milwaukee, Wis.
 Matthews, Chas., Newportsville, Pa.
 Mann, John G., and wife, Baltimore, Md.
 Martin Carriage Works, York, Pa.—E. A. McGrew.
 Empire Buggy Co., Jackson, Ga.—S. P. Nichols.
 Eufalia (Ala.) Buggy Co.—Eugene R. Pruden.
 Piedmont Buggy Co., Monroe, N. C.—T. J. Payne.
 Banner Buggy Co., St. Louis, Mo.—W. H. Roninger and wife, E. L. Roninger.
 Wilkinson Co., John G., Newburg, N. Y.—Mark Reeks.
 Richards, B. R., Philadelphia, Pa.
 Rowland Buggy Co., Sumter, S. C.—S. K. Rowland.
 Sechler & Co., Cincinnati, O.—R. E. Rowalt.
 Eastern Wagon Works, Atlantic City, N. J.—R. Rankins.
 Sayers & Scovill Co., Cincinnati, O.—W. A. Sayers.
 Delker Co., Geo., Henderson, Ky.—C. P. Schlamp.
 Scholl, H. S., and wife, Mifflintown, Pa.
 Racine-Sattley Co., Racine, Wis.—W. C. Sage.
 Seech, B. H., Davenport, Ia.
 Snyder Carriage Co., Newport, Pa.—J. L. Snyder.
 Oxford (N. C.) Buggy Co.—B. F. Taylor.
 Fine & Son, H., Danbury, Conn.—Rob. Fine.
 Tyson & Jones Buggy Co., Carthage, N. C.—Thos. B. Tyson, Mrs. Evelyn B. Tyson.
 Van Ayars, A.—Roadstown, N. J.
 Virginia Buggy Co.—Chas. H. Behlen.
 Perkaskie (Pa.) Carriage Co.—M. F. Weisel, L. B. Weisel.
 Wolf, H. L. and J. D., Penn Square, Pa.
 Wilson, Daniel T., New York City.
 Elizabeth City (N. C.) Buggy Co.—W. P. Wood.
 High Point (N. C.) Buggy Co.—Henry A. White and wife.
 Mann, J. G., Baltimore, Md.—E. E. Weaver.
 Peters Buggy Co., Columbus, O.—R. H. Wilcox.
 Yeakle, Jas. M. and wife, Bethlehem, Pa.
 Atlantic Wagon Works, Atlantic City, N. J.—Geo. C. Godfrey.

REGISTRATION OF ACCESSORY MANUFACTURERS.

Aden Mfg. Co., Danville, Va.—Jos Aden, C. G. Holland.
 Ansted Spring & Axle Co., Connersville, Ind.—E. W. Ansted.
 Automatic Axle Co., Lancaster, Pa.—Otto Bohn, A. R. Gantz, A. H. Worrest, E. W. Worrest.
 American Axle Works, Philadelphia, Pa.—A. J. Foote and wife.
 Edward F. Alf Co., Cincinnati, O.—E. F. Alf, H. C. Jay.
 Chas. H. Albrecht & Co., Cincinnati, O.—E. R. Wagner, Carl H. Albrecht.
 American Tire Drill Co., Cincinnati, O.—Geo. Linser, Geo. H. Otting and wife.
 American Mills Co., Rockville, Conn.—C. R. McLean, C. N. McLean.
 American Oak Leather Co., Cincinnati, O.—J. F. Taylor.
 Ahr & Rost Co., Cincinnati, O.—G. J. Rost.
 Bookwalter Wheel Co., Miamisburg, O.—Chas. L. Bookwalter and wife.
 Beckwith Chandler Co., Newark N. J.—W. L. Crossman, G. A. Taylor and wife, L. M. Alleman, C. H. Hull.
 Buffalo (N. Y.) Forge Co.—E. F. Archer.
 Bauer Bros. Mfg. Co., Cincinnati, O.—J. O. Bauer.
 R. T. Bowen & Son, Bridgeton, N. J.—R. T. Bowen.
 Blakeslee Forging Co., Plantsville, Conn.—C. C. Chamberlin and wife.
 Buckeye Wheel Co., Gallon, O.—Frank Flickinger and wife.
 Baltimore (Md.) Hub Wheel Mfg. Co.—R. C. Looch.
 C. C. Bradley & Son., Syracuse, N. Y.—C. C. Bradley Jr., F. L. Schaff.
 Backstay Machine and Leather Co., Union City, Ind.—S. H. Clark.
 R. L. Hill, R. C. Shimmel, Mrs. Ross, Miss Ross, Mrs. Smith.
 Buser-Poston Tufting Machine Co., Chillicothe, O.—Joe Federle, B. C. Poston.
 Clarence Brooks & Co., Newark, N. J.—J. E. Cope, C. H. Russell.
 Barndt & Johnson Auto Supply Co., Columbus, O.—J. S. Nelson.
 W. B. Byron & Sons Co., Williamsport, Md.—Frank Shacklett, E. J. Brown, J. C. Byron, O. L. Beachley.
 Campbell & Dann Mfg. Co., Tullahoma, Tenn.—J. L. Dann.
 Geo. R. Carter Co., Connersville, Ind.—Geo. R. Carter, Curtis Withrow.
 Cleveland-Akron Bag Co., Cleveland, O.—H. W. Merrick.
 E. D. Clapp Mfg. Co., Auburn, N. Y.—D. E. Clapp.
 Cately & Ettling, Cortland, N. Y.—H. C. Ettling and wife, Mrs. Alice M. Ettling.
 Cleveland Tanning Co.—H. N. Hill and wife, Homer McDaniel and wife, H. M. Laundon and wife.
 Cleveland (O.) Hardware Co.—Chas. Adams and wife, C. J. Wright.
 P. W. Andrus, A. O. Allen, M. H. Chase and wife, W. F. Gibbons, J. R. Swan and wife, O. T. Sanderson, J. W. Baxter, E. A. Carl.
 D. L. Carpenter & Co., Cincinnati, O.—D. L. Carpenter, J. W. Weltzel and wife.
 Cleveland (O.) Bolt Mfg. Co.—C. P. Kelley.
 Cleveland Axle Mfg. Co., Canton, O.—G. A. Laughlin, O. J. Strayer.
 Columbus (O.) Bolt Works—J. R. Poste, Oren Ross.
 Cambria Steel Co., Cincinnati, O.—W. F. Vosmer, L. M. Morris.
 Chilton Co., Philadelphia, Pa.—H. S. Buzby.
 Champ Spring Co., St. Louis, Mo.—C. E. M. Champ and wife, N. B. Champ.
 Crane & MacMahon, St. Marys, O.—Mrs. MacMahon, Miss MacMahon, T. A. White.
 Crane Valve Co., Bridgeport, Conn.—F. J. Mulcahy.
 Conneaut (O.) Leather Co.—E. L. Wellman.
 L. C. Chase & Co., Boston, Mass.—R. R. Bishop, Wm. Walden, J. Clemons, L. H. Hubbell, John Hopewell.
 The W. H. Coe Mfg. Co., Providence, R. I.—B. A. Smith.
 Carriage Woodstock Co., Owensboro, Ky.—Chas. A. Malnor.

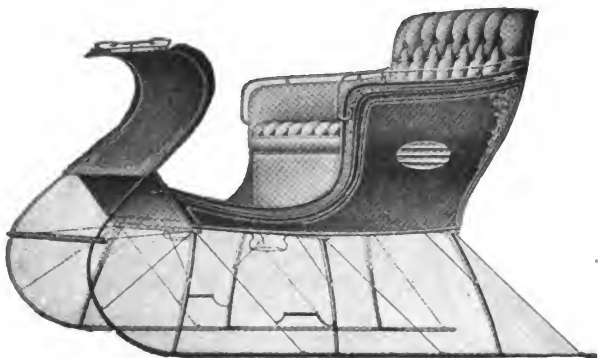
Consolidated Rubber Tire Co., New York City—J. D. Cary, W. P. Hollingsworth, F. A. Kissell, F. E. Holcomb, E. H. Miller, Van H. Cartmell, E. S. Roberts, W. L. Warden.
 Cooper Carriage Woodwork Co., St. Louis Mo.—R. M. Cooper.
 Cortland Cart & Carriage Co., Sidney, N. Y.—L. I. Hatfield, P. O. Wheeler.
 Cortland Carriage Goods Co., Cortland, N. Y.—Miss T. Case, J. Jenkinson, A. E. Roninger, M. Ritchie, A. J. Murray.
 Chicago Varnish Co.—Wm. Altemeir, R. L. Brewer, A. W. Curtis and wife, Edw. Huling and wife.
 Cortland Forging Co., Cortland, N. Y.—L. D. Church, F. L. Titchener, Miss Helen Titchener.
 Carnegie Steel Co., Cincinnati, O.—J. E. Woods, Wm. Breeden, W. G. Clyde, J. G. Carruthers, L. N. Hall and wife.
 C. Cowles & Co., New Haven, Conn.—M. S. Bottume, H. P. Bradley, C. M. Costello, F. N. Runet, T. T. Wells and wife.
 Crandal-Stone & Co., Binghamton, N. Y.—Frank E. Howland, B. B. Lynch, wife and daughter, N. A. Boyd, Otto Heinrichsdorf, Jr., and wife, Bruce M. Stannard, C. E. Titchener.
 Diamond Rubber Co., Akron, O.—Edw. Anderson, E. F. Howell, W. L. Shaffner, E. P. Stroup, C. W. Simpson.
 Louis Dusenbury Co., New York City—F. M. Brown and wife, H. D. Cottill, A. N. Dusenbury and wife.
 Ditzler Color Co., Detroit, Mich.—Chas. Roth, F. H. Shevaller, P. M. Ditzler and wife, H. A. Crumley, Ida Lang, Pauline Lang.
 Detroit (Mich.) White Lead Works—J. A. Creighton.
 H. H. DeWitt Co., Oakland City, Ind.—H. H. DeWitt, Mrs. Harry DeWitt.
 J. V. Diefenthaler, Newark, N. J.—J. J. Berry, J. V. Diefenthaler.
 Dann Bros. & Co., New Haven, Conn.—C. B. Dann.
 Dayton Malleable Iron Co., Dayton, O.—H. E. Morrill.
 W. E. Derby & Co., New York City—E. M. Rand and wife.
 Horace Ervien, Ogontz, Pa.—Horace Ervien.
 Eberly & Orris Mfg. Co., Mechanicsburg, Pa.—A. G. Eberly, Mrs. A. A. Eberly, J. C. Lambert.
 Empire Rubber Mfg. Co., Trenton, N. J.—H. R. Mason.
 W. A. Eberly Wheel Works, York, Pa.—F. Schneider.
 Enterprise Brass & Plating Co., Cincinnati, O.—Geo. Apfel.
 The Eberhard Mfg. Co., Cleveland, O.—Wm. Austin and wife, W. P. Champney and wife, F. M. Edgar and wife, Jos. Erret and wife, C. A. Hennicke and wife, S. M. Kelsey, wife and daughter, Mrs. L. D. Lutz, John McGrath, C. F. Reynolds, C. U. Samuelson, Geo. B. Shepard and wife, T. W. Armstrong, L. D. Lutz.
 Richard Eccles Co., Auburn, N. Y.—Richard Eccles, Wm. W. Eccles.
 Randolph Edwards Co., Jackson, Mich.—C. R. Smyth and wife, H. E. Edwards.
 Eureka Bending and Wheel Works, York, Pa.—J. L. Bower, G. W. Tschof, W. G. Leas, C. E. Rower, Miss M. E. Musselman.
 Excelsior Seat Co., Columbus, O.—D. E. Pittinger.
 Forbes Varnish Co., Cleveland, O.—C. J. Forbes.
 Fabrikoid Works, Newburg, N. Y.—A. E. Prince, H. W. Wivel, J. K. Rodgers.
 Empire Rubber Mfg. Co., Trenton, N. J.—Wm. T. Harvey and wife, J. N. Stark.
 Fairfield Rubber Co., Fairfield, Conn.—G. W. Husted, E. W. Harral, W. W. Harral, A. C. Wheeler.
 Fine Woolen Co., New York City—Geo. L. Taft, F. J. Partland.
 Federal Rubber Co., Milwaukee, Wis.—A. A. Frank, W. H. Piggott, M. C. Center, F. A. Drake, H. A. Githens.
 Fernald Mfg. Co., North East, Pa.—R. J. Matthews, E. M. Selkregg and wife.
 Flint (Mich.) Specialty Co.—J. Cornwall.
 Falls City Buggy Top Co., Louisville, Ky.—R. O. Rubel.
 C. D. Franke & Co., Charleston, S. C.—Elliott Dunn, Mrs. L. C. Dunn, J. H. Jahnz.
 Firestone Tire and Rubber Co., Akron, O.—A. P. Cleveland, N. T. Esterly, C. H. Torrick, Geo. A. Talbot, T. O. Doane, C. H. Gerhold, A. G. Partridge, Wm. C. Waters, H. S. Firestone, W. F. West.
 Jacob Gerhab, Philadelphia, Pa.—J. B. Dalrymple, Wm. Gerhab and wife, Jacob Gerhab and wife, Chas. B. Ising.
 Goodyear Tire and Rubber Co., Akron, O.—W. R. Barnes, Chas. Measure, Clarence Pongrace, T. C. Van Bever, E. B. Williams, T. W. Powers, J. E. Taylor, J. A. Moroney, A. F. Osterloch, W. D. Shilts, G. M. Stadelman.
 Gramm Motor Truck Co., Lima, O.—A. T. Gardiner, John Dougherty, Fitch Gear Co., Rome, N. Y.—L. M. Fitch and wife, John Herbst.
 Gresham Mfg. Co., Griffin, Ga.—N. J. Baxter, J. W. Gresham, C. B. Gresham, Mrs. Maude Smith.
 Jos. L. Gibley & Bro., Philadelphia, Pa.—T. J. Manning.
 P. F. Glynn, Philadelphia, Pa.—P. F. Glynn.
 Higgin Mfg. Co., Newport, Ky.—J. A. McCroskey, Henry Higgin and wife.
 Gregg Varnish Co., St. Louis, Mo.—Price Thompson.
 The Herbrand Co., Fremont, O.—Chas. Thompson, C. F. Thompson.
 T. P. Howell & Co., Newark, N. J.—E. E. Lowndes.
 Hildreth Varnish Co., New York City—R. R. Paradis.
 Hoopes Bro. & Darlington, West Chester, Pa.—H. C. Coleman, H. B. Coleman, E. S. Darlington and wife.
 Illinois Iron and Bolt Works, Carpentersville, Ill.—W. C. Martin, H. C. McNeil and wife.
 Imperial Wheel Co., Flint, Mich.—C. F. Ferguson.
 Indianapolis Dash Co., Indianapolis, Ind.—J. A. Marshall, R. H. Harnden.
 Hess Pontiac (Mich.) Spring & Axle Co.—B. A. Litchfield.
 Phineas Jones & Co., Newark, N. J.—Henry P. Jones.
 Hess Spring & Axle Co., Cincinnati, O.—E. J. Hess and wife.
 Wm. H. Horstman Co., Philadelphia, Pa.—J. F. Kruse and wife.
 Jackson Cushion Spring Co., St. Louis, Mo.—G. B. Ogan.
 Howell-Hinchman Co., Middletown, N. Y.—B. H. Strauss.
 Kalamazoo (Mich.) Spring & Axle Co.—Chas. H. Eaton.
 Kennedy, Willing & Co., Philadelphia, Pa.—E. C. Schellenberger.
 E. B. Barr, L. H. Morris, John Nilling.
 Keystone Forging Co., Northumberland, Pa.—T. O. Van Alen, J. D. Weekes and wife, Isaac Cornwall.
 A. Kimble Co., Zanesville, O.—Andrew Kimble and wife, F. A. Kimble, R. H. Kimble.
 Keystone Sheet Metal Co., Ambridge, Pa.—A. H. Adams, W. W. Wilson.
 Kelly & McLaughlin, Newark, N. J.—Wm. A. Kelly.
 Keystone Spring Works, Philadelphia, Pa.—W. L. Taylor.
 King Fifth Wheel Co., Philadelphia, Pa.—A. C. Chase, Mrs. A. O. Chase.
 Lowell (Mass.) Thread Mills—Jno. C. Meyers.
 Lee & Porter Mfg. Co., Dowagiac, Mich.—Jud S. Clary.
 Philip Lebzelter & Son Co., Lancaster, Pa.—Philip Lebzelter.
 Liggett Spring and Axle Co., Pittsburg Pa.—W. P. Davis, J. H. Kenhart, H. R. McMahon and wife, Mrs. J. W. Newhart, F. H. Sparks.
 Lyle Bros., Pittsburg, Pa.—W. J. Williams.

The Lowe Bros Co., Dayton, O.—W. J. Shonder, E. C. Sullivan and wife.
 Chas. F. Luehrmann Hard Lumber Co., St. Louis—A. M. Todd and wife.
 Lamson & Sessions Co., Cleveland, O.—G. M. North.
 Wm. R. Laidlaw, Jr., New York City—R. L. Gilman, Wm. R. Laidlaw, Jr., M. Sullivan.
 Henry Lang Co., Newark, N. J.—J. P. Lafoy.
 Lapham Bros. Co., New York City—W. S. Lapham.
 Linen Thread Co., Philadelphia, Pa.—H. B. Nichols.
 J. W. Masury & Sons, New York, N. Y.—J. H. Bodine, A. R. Cook, W. F. Egan, T. I. Morrow, F. E. Mulford, D. A. Reidy, T. J. Ronan, S. H. Smith.
 Metal Stamping Co., Long Island City, N. Y.—W. R. Noyes, J. F. Galvin.
 McKinnon Dash Co., Buffalo, N. Y.—M. C. Woods, W. A. Notman, L. E. McKinnon.
 Mifflinburg Body and Gear Co., Mifflinburg, Pa.—O. S. Bucke, H. W. Orwig.
 Mohawk Valley Mfg. Co., Utica, N. Y.—R. T. Thomas.
 Edward C. Moore Co., Newark, N. J.—L. E. Harrison.
 D. C. Miller, Baltimore, Md.—D. C. Miller.
 Geo. C. Morton, Wilmington, Del.—M. J. Morton.
 E. H. McCormick & Sons, Newark, N. J.—J. H. McCormick.
 Murphy Varnish Co., Newark, N. J.—Franklin Murphy, Jr., J. J. Nicholson, W. H. Parry, Franklin Murphy, Sr.
 Mosman, Yarnelle & Co., Ft. Wayne, Ind.—L. B. Anger, H. J. Miller, E. T. Yarnelle.
 Monarch Carriage Goods Co., Cincinnati, O.—M. C. Weiglein, Misses J. M. and Eola Weiglein.
 Moller & Schumann Co., Brooklyn, N. Y.—H. Holzman, O. Smith.
 Muncie Wheel Co., Muncie, Ind.—O. B. Bannister, F. W. Shideler.
 F. A. Nelder & Co., Augusta, Ky.—G. S. Welmer.
 The Mulholland Co., Dunkirk, N. Y.—O. B. Mulholland.
 Mander Bros., Wolverhampton, Eng.—J. S. Fonash, Louis Bach, A. E. Louderbach and wife.
 Newark (O.) Gear Wood Co.—Geo. L. Smith.
 National Malleable Castings Co., Cleveland, O.—J. A. Slater and wife.
 Powitsky & Collins, St. Louis, Mo.—H. F. Powitsky.
 Peters & Herron Dash Co., Columbus, O.—J. D. Kilmer, M. K. McCaughy, Chas. M. Peters.
 J. M. Palmer Co., Brooklyn, N. Y.—J. M. Palmer and wife.
 Pioneer Pole and Shaft Co., Piqua, O.—A. R. Fiedmann, C. O. Whitney, H. C. Whitney, H. D. Hartley, W. M. Hamilton.
 Pomeroy & Fischer, New York City—J. J. Cone and wife.
 Philadelphia (Pa.) Storage Battery Co.—E. C. Mulcey.
 Ness Bros. Co., York, Pa.—J. L. Ness.
 H. K. Porter, Everett, Mass.—P. D. Randall.
 P. Reilly & Sons, Newark, N. J.—C. J. Clark, W. G. Peters.
 John Reilly Co., Newark, N. J.—A. T. Wishart, T. S. Miller.
 Jas. H. Rhodes & Co., Chicago, Ill.—K. F. Griffiths, John D. King, E. R. Murphy.
 Queen City Forging Co., Cincinnati, O.—O. E. Walker.
 R. E. Rodriguez, New York City—Thos. McMahon, R. E. Rodriguez.
 Raser Tanning Co., Ashtabula, O.—H. M. Kunkle and wife, W. J. Kunkle.
 Reed & Prince Mfg. Co., Worcester, Mass.—J. V. Banks and wife.
 Wm. & Harvey Rowland, Frankford, Pa.—S. N. Kent, Edw. Rowland.
 Radel Leather Mfg. Co., Newark, N. J.—Jos. F. Meyers.
 Wm. A. Reilly & Son, Wilmington, Del.—F. W. Reilly.
 Rex Imperial Leather Co., Newark, N. J.—O. W. Tunison and wife.
 Republic Iron and Steel Co., New York City—Miss J. S. Fletcher, M. H. Oliver, C. H. Tinker.
 E. F. Rogers Co., Philadelphia, Pa.—E. F. Rogers, E. L. Boyer, wife and daughter, Mrs. Florence E. Rogers, Mrs. E. Rowland, A. L. Woodward.
 Rose Mfg. Co., Philadelphia, Pa.—A. Johnson, H. C. Rosenbluth, G. W. K. Voight.
 Roy Woolen Co., Watervliet, N. Y.—D. W. Tillinghast.
 Schubert Bros. Gear Co., Onelda, N. Y.—Geo. Schubert.
 Sheldon Axle Co., Wilkes-Barre, Pa.—J. A. Young and wife, H. W. Bowman, J. B. Deiker, W. J. Daniels, E. J. Rose, O. A. Timberlake, G. M. Wall, W. V. Brown, W. H. Son.
 Sherwin-Williams Co., Cleveland, O.—G. E. Branham, J. C. Hasson, D. J. Moore, F. A. Randall, J. R. Swan and wife, C. W. Wallace, J. D. Atherton, O. E. Tichenor, W. B. Wise.
 Sidney Mfg. Co., Sidney, O.—P. P. Dyke.
 Shortsville Wheel Co., Shortsville, N. Y.—S. L. Heath, John F. Wilson.
 Stewart Mowry Co., Chicago, Ill.—Val Steinle and wife.
 Edward Smith & Co., New York City—J. F. McBride and wife, J. W. Welch.
 August Schubert Wagon Co., Onelda, N. Y.—August Schubert.
 Southern Wheel Co., Oxford, N. C.—C. S. Gorman.
 Scranton (Pa.) Axle & Spring Co.—O. C. Hall and wife.
 Geo. Stengel, Inc., Newark, N. J.—Harry Stengel.
 Royer Wheel Co., Cincinnati, O.—H. D. Pfeiffer.
 J. M. Skinner Bending Co., Toledo, O.—C. V. Skinner.
 Scranton (Pa.) Forging Co.—C. H. Pond.
 L. M. Smith & Sons, Newark, N. J.—L. M. Smith, H. Dalrymple.
 Stichter Hardware Co., Reading, Pa.—T. D. Ayres, H. E. Butterick and wife.
 Silgo Iron Store Co., St. Louis, Mo.—E. H. Seese.
 Roehm & Davison, Detroit, Mich.—J. H. Austin, C. M. Roehm.
 S. Slater & Sons, New York City—T. E. Hebringle.
 Republic Rubber Co., Youngstown, O.—G. M. Hoffman, F. A. Hastings.
 Stengel & Rothschild, Newark, N. J.—A. Rothschild and wife, C. E. Stengel and wife.
 Hugh Smith Co., Newark, N. J.—H. W. Wermer.
 H. Scherer & Co., Detroit, Mich.—C. H. Davis and wife.
 Standard Varnish Works, Chicago, Ill.—Arthur Davis, Chas. H. Mobbs and wife, J. B. Stockton, A. L. Steinberg, S. L. Stonehill, C. M. Bradley, H. B. Chilcote and wife.
 Standard Wheel Co., Terre Haute, Ind.—F. P. Mills, E. J. Fischer, Carl Fischer.
 Standard Wheel Co., Toledo, O.—T. W. Jewell, S. Rhoades.
 Spear Axle Co., Wheeling, W. Va.—Chas. Reitz, Andrew Reitz.
 M. Straus & Sons, Newark, N. J.—Jack H. Lehman, B. W. Straus, Mrs. Minnie Straus, Lewis M. Straus.
 The Swinehart Tire and Rubber Co., Akron, O.—Geo. E. Grines, F. D. Walt, C. O. Dall.
 Wm. H. Toner, Wilmington, Del.—Wm. H. Toner, H. D. Taylor Co., Buffalo, N. Y.—C. E. Wettauer.
 Geo. Tiel & Co., Philadelphia, Pa.—S. F. Wright.
 Taunton (Mass.) Oil Cloth Co.—C. T. Newbury.

Union Nut Co., Unionville, Conn.—Frank S. Brewer.
 Wayne Wheel Co., Newark, N. J.—W. W. Benedict, R. W. Jessup.
 E. S. Ward & Co., Newark, N. J.—W. R. Ring, R. S. Ward.
 West Tire Setter Co., Rochester, N. Y.—S. E. Tumatly and wife, E. A. Grinelle and wife, Mrs. J. B. West.
 Valentine Varnish Co., New York City—R. A. Bittong and wife, A. A. Morrill and wife, J. H. Wilson.
 Western Spring and Axle Co., Cincinnati, O.—J. S. Beatty and wife, Chas. Hefflinger and wife, J. B. Childe and wife, E. V. Overman.
 D. Wilcox Mfg. Co., Mechanicsburg, Pa.—F. E. Hickox, F. E. Wilcox and wife, Miss Mary D. Clark, S. F. Hawk and wife, J. H. Koller, E. S. Hauck, R. H. Thomas and wife.
 C. A. Willey Co., Hunters Point, N. Y.—E. M. Holler, Geo. B. McClain and wife, H. C. Willey and wife, D. Anderson, E. C. Surganty, R. W. Bowen, C. A. Willey and wife.
 Peter Woll & Sons Mfg. Co., Phila., Pa.—R. Krobitsch and wife, Miss M. Krobitsch, Oscar Krobitsch, Miss Henrietta Krobitsch.
 York Wagon Gear Co., York, Pa.—R. A. Paules.
 Chas. Wing Co., Amesbury, Mass.—F. S. Collins.
 Zanesville (O.) Gear Wood Co.—A. Nutter.
 Union (N. Y.) Vehicle Forging Co.—F. S. Titchener.
 United State Tire Co., New York City—H. S. Walters and wife, F. Resser.
 Geo. Waldman, Philadelphia, Pa.—Mrs. Christina Waldman, Miss Ida Waldman.
 A. Van Ayars, Roadstown, N. J.—Wm. E. Brooks.
 Wilson Hdw. Co., Wilmington, Del.—L. H. Fairland, H. H. Raby.
 Zwick & Greenwald Wheel Co., Dayton, O.—L. H. Rogge.
 J. B. Walters & Co., Dayton, O.—Mrs. J. B. Walters and daughter.
 Westfahl File Co., Milwaukee, Wis.—P. C. Westfahl.

SLEIGHS.

Ames-Dean Carriage Co., Jackson, Mich., have a dandy line of sleighs for this season, as a glance at their announcement elsewhere in this issue will testify. This concern is now running at its full capacity, turning out sleighs for the trade. It is a good time to place an order for your requirements. The dealer knows if he waits too long, he finds that it is very hard to



get the goods, and sometimes the prices are stiffer. Ames-Dean Carriage Co. want orders right now.

In addition to the six styles shown in their advertisement, we are publishing another one of their good sellers. Catalogue containing most every popular style of sleigh will be mailed upon request, and prices are being quoted that keep the factory busy turning out the goods. Get in touch with this popular progressive institution and get your order in early.

VISIT WIGGERS.

A cordial invitation is extended to those in attendance at the Tri-State Exhibit to visit the Wiggers Co., 1417-1423 Plum St., Cincinnati. This concern is building up a reputation as manufacturers of superior bodies and seats for the carriage and auto trade. It is making a specialty of well made woodwork and invites the attention of those who have been having trouble with their bodies and seats.

This company is willing to guarantee its products to be first class in workmanship and material. All of the latest novelties in seats are being made. This company has quite a demand for its snken panel auto seat. They are turning them out by the hundreds for a long list of satisfied customers. Don't fail to look them up while you are in Cincinnati.



SOMETHING NICE METAL-WISE.

This is an illustration of a metal body of new lines intended to serve the purpose of a racer-runabout. It is made by Schubert Bros. Gear Co., Oneida, N. Y.

A study of the lines shows the practical head of the carriage body designer. The concern of which Mr. George Schubert is the controlling technical mind has always stood high in character and originality of work.



The auto body illustrated has many unique points of construction in which aluminum is cleverly handled to get a result that combines strength, novel lines, and something that is good for the eyes to look upon.

This however, is only one style out of many from which those seeking automobile bodies can choose from the line made.

ESTABLISH NEW YORK BRANCH.

Phineas Jones & Co., of Newark, N. J., the wheel makers to the carriage and automobile trade, have established a branch house at Twelfth avenue and 55th street, New York City. At this location will be found a fully equipped plant for making repairs of automobile wheels. This is an enterprising move by this prominent concern, and is in keeping with the progressive methods that prevail at this institution.

GOOD EXHIBIT.

The Colonial Carriage Co., of Circleville, Ohio, has a very interesting exhibit for dealers for the Tri-State exhibition in Cincinnati. In the group is storm buggy, phaeton, three Kentucky special buggies, and an auto-seat job. Mr. B. T. Hedges has the exhibit in charge, assisted by the Southern representative, W. A. Packard.

ARE YOU REPRESENTED ON THE COAST?

T. H. Speddy & Co., 416-417 Balboa Building, San Francisco, Cal., prominent manufacturers' sales agents for carriage, wagon and auto materials, are desirous of securing first class accounts from manufacturers. They are especially interested in getting a line of enamel leather, rubber-cloth, auto-top fabrics, trimmings of all kinds. It would be well for manufacturers to correspond with this company.

FROM GERMANY.

H. Zornow, Ing., Hamburg 37, Hochalle 115, Germany, wants prices, terms, catalogues, circulars, etc., covering carriage and sleigh bodies, automobile bodies, (wood or metal, in the white and unfinished metal body), and woodworking and bending machinery.

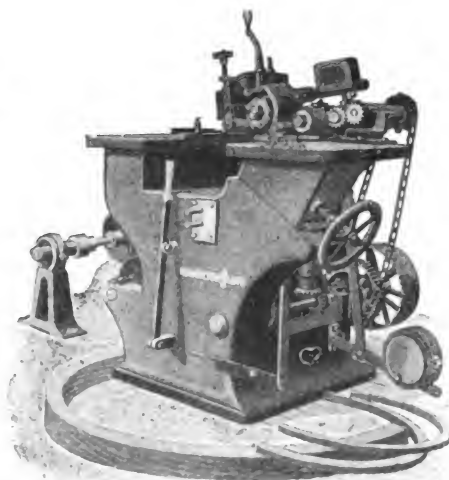
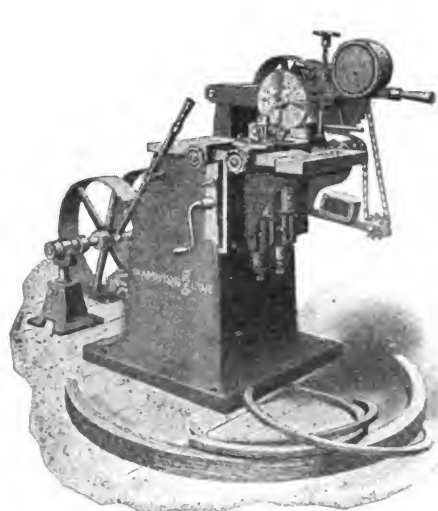
INFORMATION.

The Wheel and Wood Bending Co., Bridgeport, Conn., wants the names and addresses of builders of bob sleighs.

TWO "HAMILTONS" OF MERIT.

Here are illustrations of two side-rim planers, one working the inside and tread of the rim, the other working or planing the the two sides of the rim. In a shop they necessarily work in couples, and we so depict them. They are made by that sterling concern, the Bentel & Margedant Co., of Hamilton, Ohio, to whom inquiries for more technical details should be addressed.

The No. 383 planer for inside and tread work is designed for both light and heavy work. It can, however, be used alone. When used in connection with the other machine one operator can run both machines, feeding the rims from one to the other. The frame is a solid cored casting with a wide base giving a firm support for the operating parts. The vertical cutter heads are carried in heavy housings adjustably mounted on the frame on dovetail slides. The front head is directly in line with the rear, and the driving or feed rolls are placed between the two heads. The upper feed roll is of large diameter and is made in two parts so it can be set close together for narrow rims or far apart for wide rims, it practically forming two feed rolls made of wide material. It is powerfully driven through compound gearing a. 1 is weighted for the proper amount of feeding pressure. A lower roll is provided in the table just below the upper one,

**Hamilton Two-Side Rim Planer No. 383.****Hamilton Two-Side Rim Planer No. 384.**

and also driven, the two making a strong, powerful feed that will not stick or bind. The heads are provided with adjustable pressure bars and chip breakers and with gauges for guiding the rims. All adjustments of the heads and chip breakers are made from the front of the machine.

The No. 384 planer is designed to plane the two sides of rims or felloes in one operation. The two horizontal heads with their housings are firmly mounted on the substantial cored frame, and can be set at any angle required, and raised and lowered as the width of the felloe demands. They will take in the lightest and heaviest rims. The front part of the table has an adjustment up and down to gauge the depth of the cut of the lower head. The feed works consist of two vertical feed rolls driven by miter gearing and adjustable for any thickness of rim. The front roll is rigid while the rear yields automatically to unequal thicknesses. In addition to these vertical rolls the machine is supplied with another and powerful horizontal feed roll. This improvement is found only on our machine and is one which adds greatly to the efficiency of the machine. It is a yielding roll bearing down on the rim as it passes between the heads for holding it down to place and assisting the feeding of the vertical rolls. The machine is supplied with chip-breaker bonnet and pressure roll, both in front and in the rear of the heads for holding and guiding the material.

The man who is ready for the inevitable never fears it—even death itself.

AN ALL-STEEL BUGGY WHEEL.

One of the most interesting exhibits of the C. B. N. A. convention was that of the Standard Wheel Co., Toledo, Ohio. They start out with a good name, for the company of the same name located at Terre Haute, Ind., and making wood wheels, is one of the good concerns, and turning out an excellent product. Every one who stopped to examine the all-steel buggy wheel remarked as to its neat appearance, its strength and numerous other good points. To look at the wheel it certainly suggests strength and durability.

The tire, which is made in either flat or channel, is of special new design, and is made heavier than ordinary, as the wheels last longer, and is of the best obtainable grade with no holes to weaken it. The rim or felloe is made of special analysis spring steel properly formed. Like the tire it has no holes to weaken it and will stand the most severe use. The tubular spokes are made of the highest grade open hearth bicycle special steel, reinforced in such a way that both ends are of double thickness and strength. The hub is made of malleable iron in two parts, machined to fit and firmly riveted together with a rivet between each spoke.

The sample shown certainly evidenced good workmanship, and the wheels were as perfect as skill would permit. The construction is quite simple and easy to understand. Mr. Jewell, who was in charge of this exhibit, stated that there were a number of these wheels in use and that in every case they were reported as light running and almost noiseless, and the construction will not permit any parts becoming loose or rattling. It seems reasonable that these wheels will not carry mud nor be affected by the weather or temperature, and when one considers the durability and life of the wheel they are cheaper in the long run than wood.

This concern distributed a booklet entitled the "Evolution of the Wheel." Anyone interested in the subject ought to send for a copy. This ought to mean everyone connected with the vehicle trade. We have pointed out a few of the good points that

The Standard Wheel Co. can name you a thousand reasons why the wheel itself and its construction suggest the wheel possesses merit. To those who have never seen this wheel it behooves them to at least investigate it. The financial connections of this concern entitle it to the confidence of the trade.

SWINEHART SALESMEN HOLD CONFERENCE.

A most successful meeting of Swinehart branch managers, salesmen and agents was held September 29 and 30 at the factory office in Akron, O. The policy for the ensuing year was discussed and plans laid for the distribution of the cellular anti-skid truck tire, which is a comparatively new product of the company. Over forty were in attendance and all those present were enthusiastic over the prospects for increased business next year. At the conclusion of the first day's conference, automobiles conveyed the party to Young's Hotel at Turkeyfoot Lake, where they were guests of the company for the evening.

CATALOGUE NO. 17.

Richard Eccless Co., Auburn, N. Y., has ready for distribution the new No. 17 catalogue which illustrates its standard lines and the new articles that have been recently added thereto. The line of carriage and wagon forged irons made by the company has always been held in justly high esteem.

CHANGED NAME.

Some eleven years ago the Spitzli Mfg. Co. was established at Utica, N. Y., and the concern scored success through the excellent quality of its goods. Roller chafe irons, couplers, auto mufflers, etc., was the line. Some months ago the coupler business was disposed of and now comes the announcement from Geo. Spitzli that the balance of the corporation's assets, with its good will, patents, etc., was on August 14th sold to the Mohawk Valley Mfg. Co. These several changes came about



A. G. Snyder.

through Mr. Spitzli having interests in so many lines, also a desire to lessen business cares.

The accompanying photo is an excellent likeness of Mr. A. G. Snyder, general manager of the Mohawk Valley Mfg. Co. This gentleman is a genius in a mechanical way, and having had complete charge of the old concern as superintendent, coupled with 27 years of mechanical successes in similar positions, we see success for him in his latest endeavor. Mr. Snyder is an office man of no mean experience also The Mohawk Valley Mfg. Co. is ready to quote prices on its full line of roller chafe irons, of which it sells great quantities.

THE DEALER SHOULD HAVE IT.

Those dealers who make a specialty of horse goods must consider a means of displaying them attractively. Not only the window but the interior of the store ought to be used for the purpose. The best appliances are racks made to do the work well and cheaply. There are many kinds, but we now call attention to the racks offered by H. G. Dreyer & Son, Cleveland, Ohio, who have specialized this business with a view to supplying racks that give fine results. Harness, saddles, robes, and anything in the horse goods line that can be best sold by display have had attention. The racks are metal, light, strong, hence durable, and they will be found to fill the bill.

BRIGHT PROSPECTS IN THE SOUTH.

Harry D. Pfeiffer, a representative of the Royer Wheel Co., and who travels in the South, reports splendid business and speaks very encouragingly of the conditions among the Southern carriage manufacturers. Bumper crops seem to be the rule and prospects bright. Mr. Pfeiffer deserves his full share of the good things to be passed around.

A STEEL STORAGE BIN.

A new steel storage bin has appeared on the market. It is intended for general use in manufacturing plants, wholesale and retail stores and jobbing houses. Made in the form of a gigantic cabinet, the size of the various bins are adjustable to varying needs. The bins are made entirely of steel, the shelving being so arranged that articles varying widely in size can be stored, by making the compartments small or large. This is done by adjusting the partitions, which are easily inserted and bolted in place. The design of the bin is somewhat similar to the ordinary egg crate. It is made up of a continuous center partition or back, the full length of the bin. This is tied into uprights placed at right angles, by stove bolts through angles turned on the uprights. This center partition, which is a back for a single face bin, serves as a center of dividing back partition for a double face bin. The uprights at right angles to the center partition or back, carry a part of the shelf load, the shelves being attached to them at the front and back by stove bolts.

Besides the back and uprights, the bottom shelves tie the construction together at the bottom while the top ledge ties it together at the top. The intermediate shelves are bolted to the uprights and center dividing partitions, tying the whole together by means of stove bolts, which may be easily removed or re-spaced.

NEW CONCERN MAKING BOWS.

The Delphos (Ohio) Hoop Co., manufacturers of carriage and auto bows, has made great strides during its two years of life. Mr. H. J. North, general manager, can be credited in a great measure with the firm's success. The bows this institution manufactures are from the best of Indiana and Ohio hardwood. Delphos is in the center of a network of railroads, five passing through the city. With the newest machinery for the manufacture of bows installed, we see no reason why the Delphos Hoop Co. cannot take care of all requirements promptly.

MR. GRAY OF THE U. S.

Chas. R. Gray is one of the Detroit representatives of the United States Tire Co., calling upon the motor truck trade. His line is solid tires. It is needless to say he is getting his full share of the trade. The reason: He has one of the best houses behind him, and he is always on the job.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department. 5 cents a word; Initials and figures count as words. Minimum price, 30 cents for each advertisement.

POSITION WANTED.

Situation Wanted—By an all-round carriage and automobile painter, striper and finisher. Prefer job in small carriage shop in small town, to take charge. Address Painter, 19 Gill St., Columbus, Ohio.

Position Wanted—Good, reliable, up-to-date trimmer-foreman wants position. Best of references as to character and ability, automobile factory preferred. Address W. K., care The Hub, 24 Murray St., New York City.

Foreman Blacksmith—Long Experience on all kinds of carriages and wagons from a push cart to the finest auto. Business wagons a specialty. Address R. R., care The Hub, 24 Murray St., New York City.

HELP WANTED.

Wanted—First class letterer and striper. Permanent position with good pay to the right man. Address The Waverly Co., Indianapolis, Ind.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Establish free examination and report if a patent can be had and exactly what it will cost. Send for circular.



No. 45.



No. 9.

Ames-Dean Carriage Co.

JACKSON, MICHIGAN

FINE LIGHT VEHICLES and SLEIGHS

Our Line of Sleigh Styles is Complete Consisting of

Portlands

Square Boxes

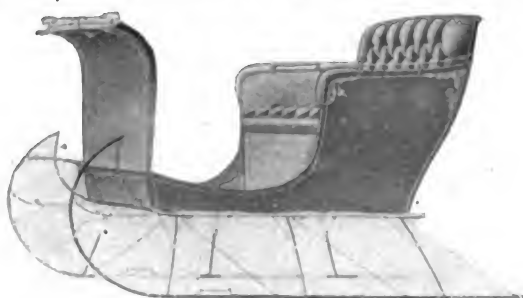
Comforts

Pleasure
Sleighs

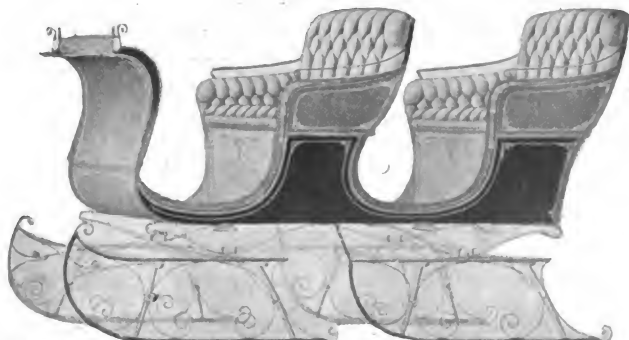
Low Gear
Comforts

Gears and
Runner
Attachments

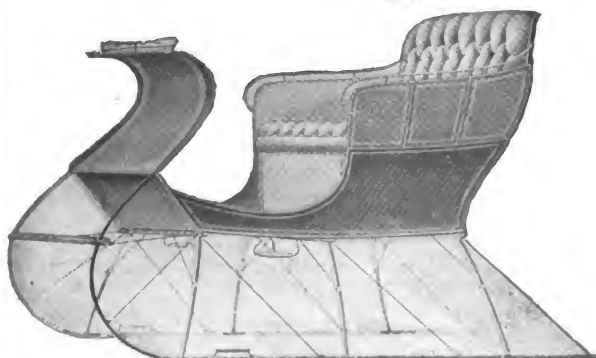
Spring
Cutters



No. 35.



No. 19



No. 2 1/4.



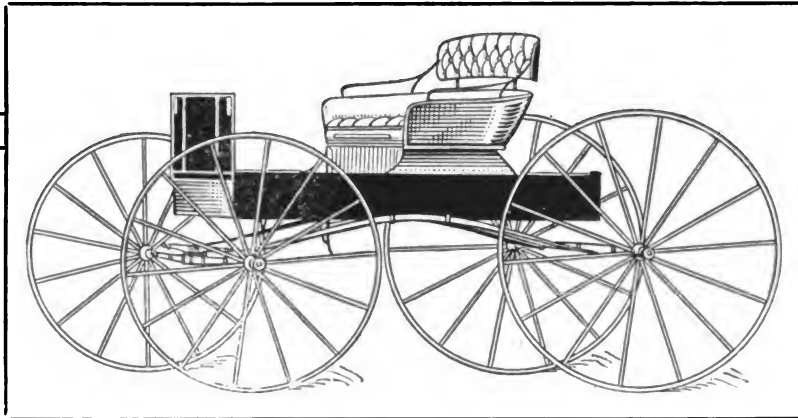
No. 33.

Write Us
For
Catalogue
Prices

Please mention "The Hub" when you write.

H. H. BABCOCK COMPANY

WATERTOWN NEW YORK



ONE OF THE LARGEST CARRIAGE BUILDERS IN THE
UNITED STATES

WRITE US FOR CATALOGUE.

THE MODERN CAR FOR MODERN WAYS

QUIET RUNNING BUT POWERFUL

BEST SHOWING in Chicago-Detroit Reliability
Contest. The ONLY CAR in its class making
ENTIRE RUN ON ITS OWN POWER.



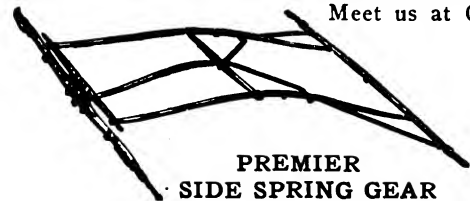
Model A—Engine, 30 H.P., 4-cycle; transmission selective;
wheels 36x2, 36x3½ in. solid, capacity 1500-2000 lbs.

Model B—Engine, 22 H.P., 4-cycle; transmission selective;
wheels, 32x3½, 33x4 in. pneumatic; capacity 500-1000 lbs.

The **BOWLING GREEN MOTOR CAR CO.**
BOWLING GREEN, O.

VEHICLES AND GEARS IN THE WHITE

Meet us at C.B.N.A.



**PREMIER
SIDE SPRING GEAR**

We also manufacture a full line of Carriage and Wagon
Bodies in the white; also Limousine, Taxicab, Touring
Car and Roadster Bodies for Automobiles in metal. Fifty
styles of gears for Carriages and Wagons; also seats,
trimmings and tops of all kinds.

Write to us for particulars.

SCHUBERT BROS. GEAR COMPANY
ONEIDA, NEW YORK

S. R. BAILEY & COMPANY, Inc.

Makers of the Celebrated.

WHALEBONE ROAD WAGON

AMESBURY, MASS.

E. SCOTT PAYNE Co.

OF BALTIMORE CITY

CARRIAGE AND AUTOMOBILE HARDWARE

362 and 364 North Gay Street,
BALTIMORE, MD.

Please mention "The Hub" when you write.

OUR NUMBER 20 BUGGY SPRINGS

Are made in one size only, but will fit all widths of piano bodies. Graceful in appearance.

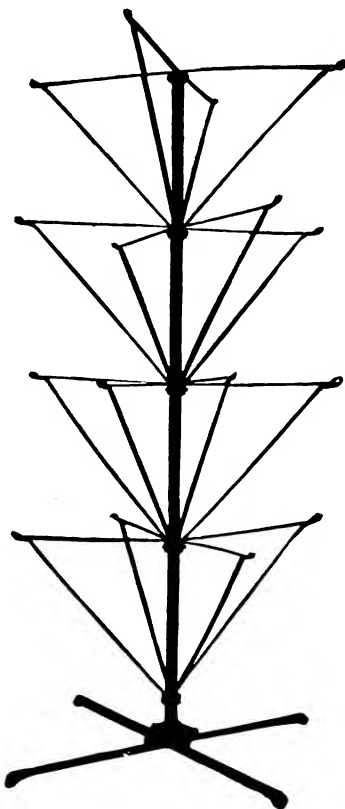
The Easiest Riding Spring on Earth

ORDER A SAMPLE SET

We want you to look us up at the Tri-State Exhibit.

THE MULHOLLAND COMPANY,

Dunkirk, N. Y.



No. 50.
Holds Collars, Blankets,
Robes, etc. Rack revolves.
Price, \$10.00.

THE DEALER'S SALESMAN

Line of Display Racks

Adopted by the up-to-date dealers all over the country.

**BECAUSE
THEY SAVE ROOM
THEY SELL GOODS**

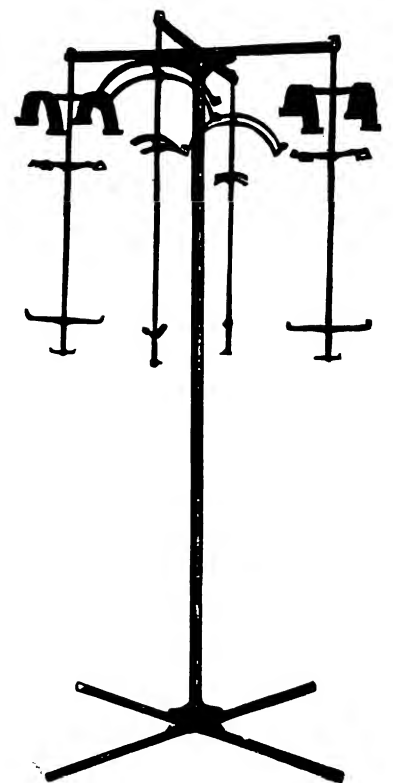
They give an up-to-date appearance to your show room, and a buyer judges your goods by the looks of your store.

**THEY KEEP YOUR SAMPLES
LOOKING NEW AND BRIGHT**

They save time in showing your line, and lead the customer to reach an immediate decision instead of making the rounds, and perhaps buying of a competitor.

Sold by All Leading Jobbers

Manufactured by
H. G. DREYER & SON
2256 W. 95th St., Cleveland, Ohio
WRITE FOR CATALOGUE.



No. 10.
Holds eight set of Driving
Harness. Entire rack re-
volves. Each hanger revolves
Price, \$10.00.

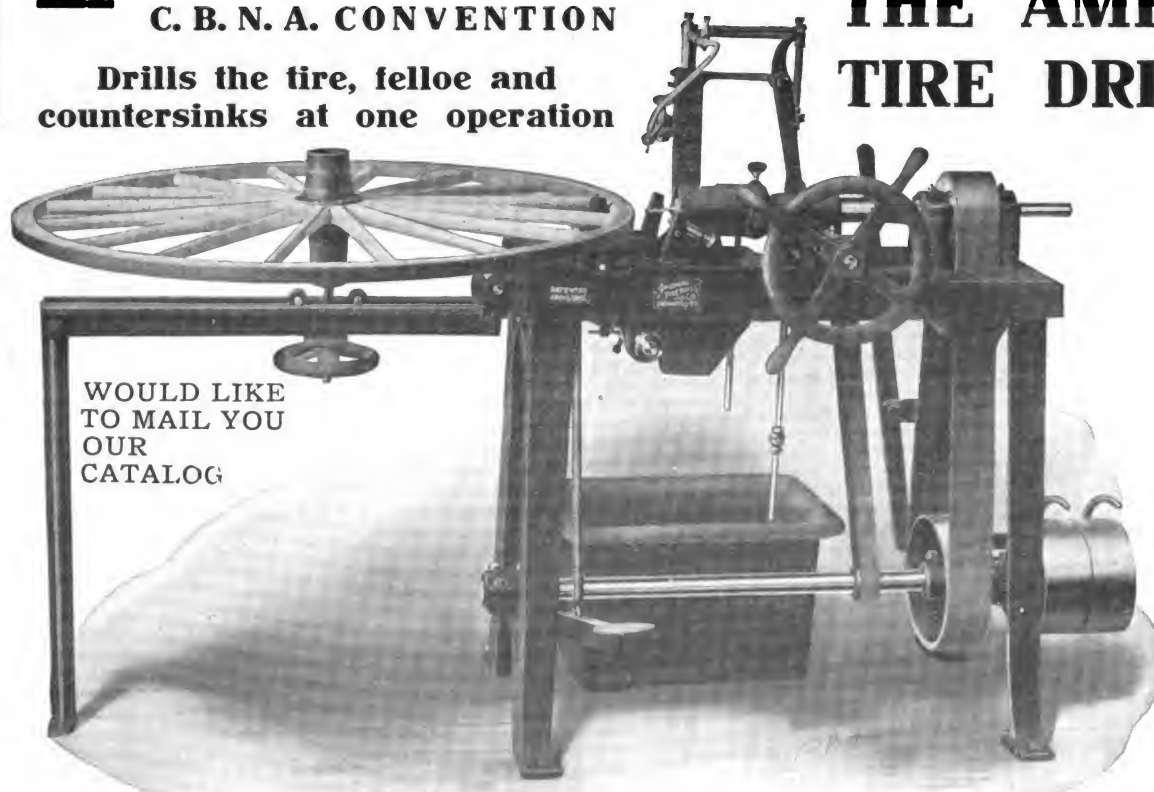
Please mention "The Hub" when you write.

INDEX TO ADVERTISERS

Ames-Dean Carriage Co.	10	Fabrikoid Co.	20	Ochsner, A. & Sons Co.	27
American Tire Drill Co.	13	Fairfield Rubber Co.	3	Ohio Seat Co.	27
American Roller Bearing 5th Wheel Co	28	Frost Gear & Machine Co.	21	Payne, E. Scott & Co.	11
Ault & Wiborg Co.	6	Gifford, John A. & Son	27	Pettingell Machine Co	19
Babcock, H. H. Co.	11	Goodrich, B. F. Co.	5	Pierce, F. O. Co.	2
Bailey, S. R. & Co.	11	Gramm Motor Truck Co.	3rd cover	Porter, H. K.	26
Bentel & Margedant Co.	6	Herbrand Co.	21	Racine Auto Tire Co.	24-25
Bicknell Mfg. & Supply Co.	28	Hildreth Varnish Co.	4th cover margin	Reilly, John, Inc.	24
Bokop Webb & Palm	27	Higgin Mfg. Co.	4th cover	Richmond Lamp Co.	26
Bowling Green Motor Car Co.	11	Hoopes Bros. & Darlington	2nd cover	Roehm & Davison	25
Buckeye Handle, Gear & Bending Co. ...	28	Hotel Cumberland	20	Russell, Burdsall & Ward Bolt & Nut Co.	3rd cover
Buckeye Paste Co.	27	Jones, Phineas, & Co.	26-28	Schubert Bros. Gear Co.	11
Burling, W. G.	27	Keystone Paint & Filler Co.	27	Shortsville Wheel Co.	21
Buser-Poston Tufting Machine Co.	16	Keystone Sheet Metal Co.	17	Standard Wheel Co., Terre Haute, Ind.	—
Cincinnati & Hammond Spring Co.	14	Landers Bros. Co.	25	Standard Wheel Co., Toledo, O.	17
Cleveland Axle Mfg. Co.	15	Lewis Spring & Axle Co.	13	Standard Oil Cloth Co.	20
Consolidated Rubber Tire Co. 1st & 2d cover		Masury, John W. & Son	2	Smith, L. M. & Son	27
Cortland Forging Co.	21	Mayo Radiator Co.	26	Stinson, Edw. Mfg. Co.	27
Columbus Bolt Works	4th cover	McKinnon Dash Co.	4th cover	Straus, M. & Son	18
Cooper Carriage Woodwork Co.	14	Metropolitan Lamp Co.	26	Timken Roller Bearing Co.	1
Crane & MacMahon	2nd cover	Mohawk Valley Mfg. Co.	24	Union City Wheel Co.	17
"Crescent" Body Works	27	Moller & Schumann Co	3	United Rim Co.	3
Crowe Nameplate & Eng. Co.	27	Moore, Benj. & Co.	3	Valentine & Co.	4
Decker, J. C.	26	Mulholland Co.	12	West Tire Setter Co.	28
Delphos Hoop Co.	27	Murray, Wm. A., Spring Co.	5	Woodman, Joel H.	28
Devos, C. T. & Reynolds Co.	3rd cover	National Spring & Wire Co.	18	Willey, C. A. & Co.	18
Diefenthaler, J. V.	20	New Wapakoneta Wheel Co.	1	Wilcox Mfg. Co.	23
Dowler, Charles L.	27	Novelty Tufting Machine Co.	3rd cover	Wiggers Furniture Co.	4th cover
Dreyer & Son, H. G.	12				
Eberhard Mfg. Co.	22				
Eccles, Richard Co.	27				
Elcelsior Seat Co.	18				

THE BIGGEST SUCCESS AT THE C. B. N. A. CONVENTION

Drills the tire, felloe and
countersinks at one operation



WOULD LIKE
TO MAIL YOU
OUR
CATALOG

THE AMERICAN TIRE DRILL CO.

CINCINNATI, O.

Invite you to a
demonstration of the
MODERN METHOD
OF DRILLING

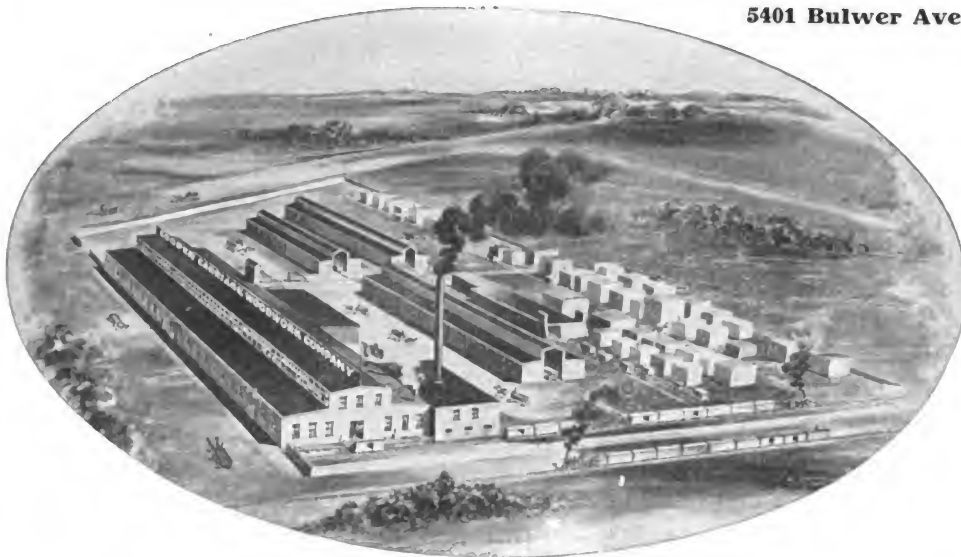
VEHICLE WHEELS

at their Factory
During the
TRI-STATE EXHIBIT
CINCINNATI, O.
OCT. 23-28

Please mention "The Hub" when you write.

COOPER CARRIAGE WOODWORK CO., ST. LOUIS, MISSOURI

5401 Bulwer Ave.



Our Specialty:

High Arch Axle Beds

We Bend All Our Axle Beds

GEARWOODS

We are adding
Still More Machinery
Our Service will be
Better Than Ever
Let us Furnish
Your Gearwoods
For 1911 -- 1912
Be Satisfied.

Get
The

"Cooper" Quality

There's
A
Difference

All Styles of Springs for Motor and Horse Vehicles

STEELS SPECIALLY HEAT-TREATED



Here is a beauty, and for easy-riding qualities and durability it is without a peer.

CINNATI & HAMMOND SPRING COMPANY

909-923 Summer Street, CINCINNATI, OHIO.

Please mention "The Hub" when you write.

"Cleveland" Axles

Are known for their practical superiority,
perfect interchangeability and finish, and cost
no more than axles of inferior quality.

No. 6½ Concord Express

For all kinds of
Wagon and Truck Work.
"The Axle that Outwears
the Wagon."

Cleveland Axle Mfg. Co.

Canton, Ohio

Cleveland-Dalzell

For the
Highest Grade Vehicles.
Wrought Iron Case-Hardened
Boxes Wear Forever.

We Manufacture a Complete Line of

**Half-Patent, Common Concord, No. 6½ Concord Express,
Cleveland-Dalzell, Doctor's Special, Pray
Spring Washer Axles**

Would be glad to receive your inquiries and can serve you promptly.

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

SPRINGS

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

Please mention "Harness" when you write.

ADVERTISEMENTS CLASSIFIED

AUTOMOBILES

Babcock, H. H. Co., Watertown, N. Y.
Bailey, S. R. & Co., (elec.) Amesbury, Mass.

AXLES

Cincinnati & Hammond Spring Co., Cincinnati, O.
Cleveland Axle Mfg. Co., Canton, O.
Frost Gear & Machine Co., Jackson, Mich.
Lewis Spring & Axle Co., Jackson, Mich.
Timken Roller Bearing Co., Canton, O.

BODIES, SEATS, ETC. (Wood and Metal)

Burling, W. G., Philadelphia, Pa.
Crescent Body Works, Reading, Pa.
Excelsior Seat Co., Columbus, O.
Keystone Sheet Metal Co., Ambridge, Pa.
Ohio Seat Co., Cincinnati, O.
Schubert Bros. Gear Co., Oneida, N. Y.
Wiggers Furniture Co., Cincinnati, O.
Woodman, Joel H., Hoboken, N. J.

BOLTS AND NUTS

Columbus Bolt Works, Columbus, O.
Russell, Burdall & Ward Bolt & Nut Co., Port Chester, N. Y.

BUCKRAMS.

Roehm & Davison, Detroit, Mich.
Landers Bros. & Co., Toledo, O.

BUGGIES

Ames-Dean Carriage Co., Jackson, Mich.
Babcock, H. H. & Co., Watertown, N. Y.
Bailey & Co., S. R. Inc., Amesbury, Mass.

CARRIAGE FORGINGS.

Columbus Bolt Works, Columbus, O.
Eccles Co., Richard, Auburn, N. Y.
Herbrand Co., Fremont, O.
Keystone Forging Co., Northumberland, Pa.
Wilcox Mfg. Co., D. Mechanicsburg, Pa.

CARRIAGES AND WAGONS (Finished)

Ames-Dean Carriage Co., Jackson, Mich.
Babcock, H. H. & Co., Watertown, N. Y.
Bailey & Co., S. R. Inc., Amesbury, Mass.

CARRIAGE, WAGON AND AUTOMOBILE
HARDWARE, SUPPLIES, ETC.

Chas. L. Dowler, Philadelphia, Pa.
Gifford & Son, John A., New York City.
Higgin Mfg. Co., Newport, Ky.
Payne Co., E. Scott, Baltimore, Md.
Gerhab, Jacob, Philadelphia, Pa.
Landers Bros. Co., Toledo, O.
Mohawk Valley Mfg. Co., Utica, N. Y.
Roehm & Davison, Detroit, Mich.

COMMERCIAL MOTOR WAGONS, TRUCKS

Bowling Green (O.) Motor Car Co.
Gramm Motor Truck Co., Lima, O.

CUSHION MFGRS.

Chas. L. Dowler, Philadelphia, Pa.

COLORS

Sherwin-Williams Co., Cleveland, O.

DASHES, FENDERS, ETC.

McKinnon Dash Co., Buffalo, N. Y.
Burling, W. G., (Metal) Philadelphia, Pa.

DISPLAY RACKS.

H. G. Dreyer & Son, Cleveland, O.

FIFTH WHEELS.

Eccles Co., Richard, Auburn, N. Y.
Wilcox Mfg. Co., D. Mechanicsburg, Pa.
American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.

GEAR WOODS.

Cooper Cge. Woodwork Co., St. Louis, Mo.
Buckeye Handle, Gear & Bending Co., Alliance, O.

LEATHER, PATENT AND ENAMELED

Diefenthaler, J. V., Newark, N. J.
Reilly, John, Inc., Newark, N. J.
M. Straus & Sons, Newark, N. J.
L. M. Smith & Son, Newark, N. J.

LINSEED OIL

Sherwin-Williams Co., Cleveland, O.

MALLEABLES.

Eberhard Mfg. Co., Cleveland, O.

MACHINERY AND TOOLS.

American Tire Drill Co., Cincinnati, O.
Buser-Poston Tufting Machine Co., Chillicothe, O.
Novelty Tufting Machine Co., Chicago, Ill.
Bokop, Webb & Palm, Defiance, O.
Porter, H. K., Everett, Mass.
West Tire Setter Co., Rochester, N. Y.
Frost Gear & Machine Co., Jackson, Mich.
Pettingell Machine Co., Amesbury, Mass.

MACHINERY, (Woodworking)

Bentel & Margedant Co., Hamilton, O.
Bicknell Mfg. & Supply Co., Janesville, Wis.
Pettingell Machine Co., Amesbury, Mass.

MOUNTINGS (Including Lamps)

Crowe Name Plate & Engraving Co., Chicago
Ochsner & Sons Co., A. New Haven, Conn.
Richmond Mfg. Co., Richmond, Ind.
Metropolitan Lamp Co., Newark, N. J.

MUFFLERS (Auto)

Mohawk Valley Mfg. Co., Utica, N. Y.

PASTE

Buckeye Paste Co., Columbus, O.

RADIATORS.

Mayo Radiator Co., New Haven, Conn.

RIMS.

United Rim Co., Akron, O.

ROLLER CHAFE IRONS

Mohawk Valley Mfg. Co., Utica, N. Y.

RUBBER TIRES

Autos, Pneumatics, Etc.

Consolidated Rubber Tire Co., New York Cy.
Goodrich Co., B. F., Akron, O.
Racine Auto Tire Co., Racine, Wis.

Carriages, Solid, Etc.

Consolidated Rubber Tire Co., New York Cy.
Goodrich Co., B. F., Akron, O.

SEATS

Schubert Bros. Gear Co., Oneida, N. Y.

SLEIGHS

Ames-Dean Carriage Co., Jackson, Mich.

SLEIGH RUNNERS.

Ames-Dean Carriage Co., Jackson, Mich.
Schofield & Co., Freeport, Ill.

SHAFT COUPLINGS.

Eccles Co., Richard, Auburn, N. Y.
Higgin Mfg. Co., Newport, Ky.

SHAFT STRAPS.

Decker, J. C., Montgomery, Pa.

SPRINGS (Cushion)

Murray, Wm. A., Cincinnati, O.
National Spring & Wire Co., Jackson, Mich.

SPRINGS, GEARS, ETC.

Cincinnati & Hammond Spring Co., Cincinnati, O.
Cleveland Canton Spring Co., Canton, O.
Frost Gear & Machine Co., Jackson, Mich.
Lewis Spring & Axle Co., Jackson, Mich.
Mulholland Co., Dunkirk, N. Y.
Schubert Bros. Gear Co., Oneida, N. Y.

TRIMMING MATERIAL

Rubber Drills, Enameled Goods, Imitation Leather, Etc.

Fabrikoid Works, Newburg, N. Y.
Fairfield Rubber Co., Fairfield, Conn.
Standard Oil Cloth Co., New York City.
Schubert Bros. Gear Co., Oneida, N. Y.

TOPS

Schubert Bros. Gear Co., Oneida, N. Y.

VARNISHES, PAINTS AND JAPANS

Ault & Wiborg Co., Cincinnati, O.
Devos, F. W., and C. T. Reynolds, N. Y. C.
Hildreth Varnish Co., New York City.
Keystone Paint & Filler Co., Muncy, Pa.
Moore & Co., Benj., Cleveland, O.
Moller & Schumann Co., Brooklyn, N. Y.
Masury & Son, J. W. New York and Chicago
Pierce Co., F. O., New York City.
Sherwin-Williams Co., Cleveland, O.
Valentine Varnish Co., New York, Chicago, Boston.
Willey, C. A. Co., Hunters Point, N. Y.

VEHICLES.

Ames-Dean Carriage Co., Jackson, Mich.
Babcock, H. H. & Co., Watertown, N. Y.
Bailey & Co., S. R. Inc., Amesbury, Mass.

WHEELS AND WHEEL STOCK.

Crane & MacMahon, New York City.
Union City Wheel Co., Union City, Ind.
Gifford & Son, John A. New York City.
Hoopes Bros. & Darlington, West Chester, Pa.
Jones & Co., Phineas, Newark, N. J.
New Wapakoneta Wheel Co., Terra Haute, Ind.
Stinson Edw. W. & Co., Baltimore, Md.
Standard Wheel Co., Terra Haute, Ind.
Shortsville Wheel Co., Shortsville, N. Y.

STEEL WHEELS

Standard Wheel Co., Toledo, O.

WOOD STOCK, BENT WOOD, ETC.

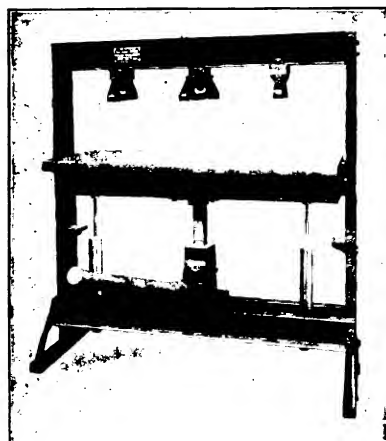
Buckeye Handle, Gear & Bending Co., Alliance, O.
Crane & MacMahon, New York City.
Delphos Hoop Co., (Bows) Delphos, O.
Gifford, John A. & Son, New York City.
Cooper Cge. Wood Work Co., St. Louis, Mo.

WHITE LEAD.

Sherwin-Williams Co., Cleveland, O.

MISCELLANEOUS

Oliver Typewriter Co., New York—Chicago



AS SWIFT AS A JACK RABBIT

Our new **LIGHTNING JACK RABBIT TUFTING MACHINE PRESS** is quicker in operation, easier operated and more powerful than any other hand power press on the market. It takes just twelve seconds to raise the platform to full height and lower the same. Scientifically correct in every detail. Would be pleased to quote you prices on same.

Ask for complete catalogue of our power driven and hand power presses, mould boards, button holders, plaiters, etc. Our new **All-Metal Button Holder** is perfect in every detail. Samples furnished upon application.

The Buser-Poston Tufting Machine Co.
Chillicothe, Ohio

WHEELS

FOR THE

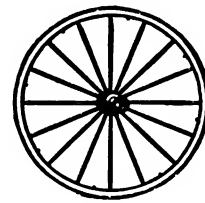
CARRIAGE TRADE



Thoroughly seasoned, carefully selected materials of best Indiana quality. Sarven, Warner and Shell Band Wheels. We operate our own supply plant in Southern Indiana.

Prompt Shipments guaranteed.

SEND FOR CATALOGUE AND PRICES



UNION CITY WHEEL COMPANY

UNION CITY, IND.

All Steel Piano Box Buggy Bodies One Piece Steel Seats



No More Checks, Splits, Corner Breaks



OUTSIDE
INSIDE

17 3/4"
16"

30"
32"
34"

Keystone Sheet Metal Co.

Factory, Economy, Pa.

Office, Ambridge, Pa.

Don't fail to make inquiry for the all-steel job at the Tri-State Show.

ALL STEEL BUGGY WHEEL

Write for
Descriptive
Booklet

The problem of an all-steel buggy wheel has been solved at last.



Patented
April 20, 1909.

The Standard Buggy Wheel is the acme of perfection in wheels; it has stood the most severe tests; is not affected by heat, cold or moisture.



Absolutely no tire troubles. Strong and light, being built of the finest bicycle steel.

Practical and durable, will not decay or rust, and is easily repaired.

It is cheap—cheaper than most if length of life is considered.

THE
STANDARD WHEEL CO.
TOLEDO, O.

Please mention "The Hub" when you write.

ESTABLISHED
1865

INCORPORATED
1895

M. Straus & Sons

NEWARK, N. J.

Tanners and Manufacturers
of

High Grade - "Beaver Brand"

CARRIAGE,
AUTOMOBILE and
UPHOLSTERY

LEATHER

Office - 440 Frelinghuysen Ave.,
NEWARK, N. J.

WILLEY'S COLORS

The RECOGNIZED STANDARD



C. A. WILLEY CO.

COLORS GRINDERS

and Manufacturers of Specialties in

CARRIAGE, AUTOMOBILE AND CAR
PAINTS

COLORS, VARNISHES, ETC.

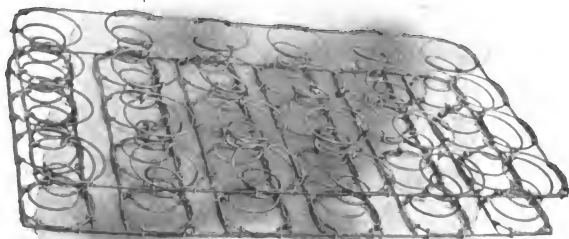
HUNTER'S POINT, NEW YORK CITY

"BLACK VELVET" CUSHION SPRINGS

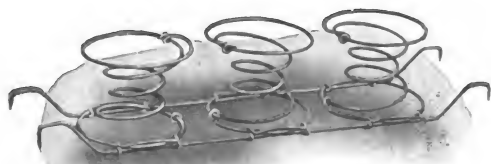
Manufactured Only by the

NATIONAL SPRING AND WIRE COMPANY
ALBION, MICH. WINDSOR, ONT.

THE SPRING OF QUALITY.



SPRING or SOFT EDGE CUSHION FRAME
For Buggies or Other Vehicles. Built of the Highest
Grade of Steel Wire.

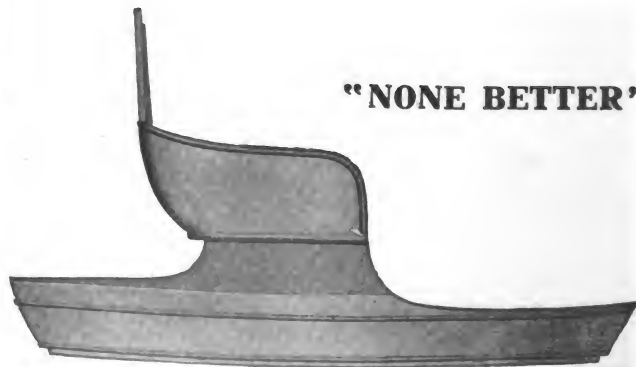


STRIP FOR WOOD OR BOX FRAME

Do You Use

"EXCELSIOR" SEATS and BODIES.

"NONE BETTER"



"EXCELSIOR" Concord Body No. 48

THE EXCELSIOR SEAT CO.

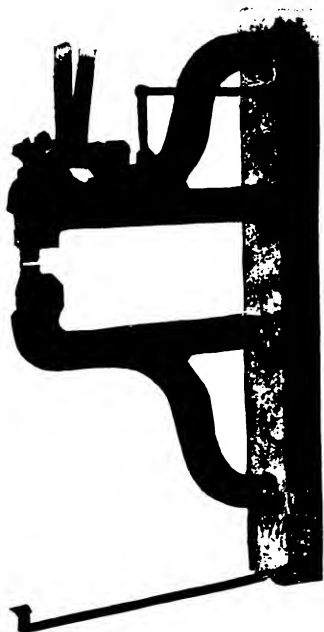
Write for Catalog.

COLUMBUS, OHIO

METAL BODY MACHINERY

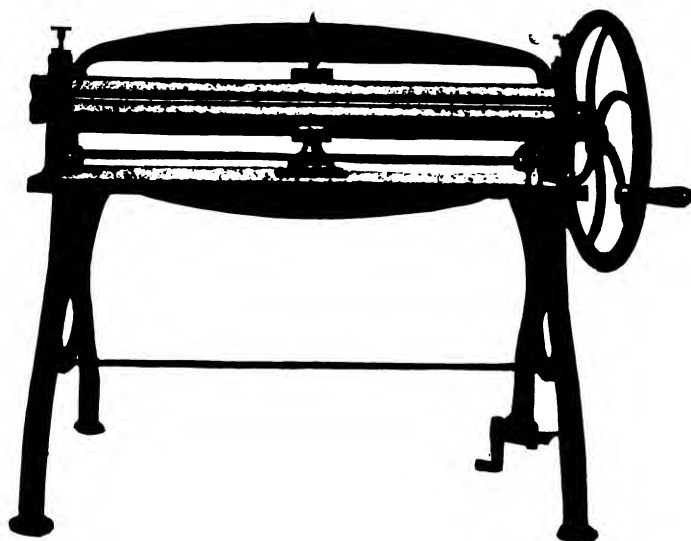
of PETTINGELL PATENTS forms the largest, if not the entire equipment of most every automobile body plant in the United States. This surely denotes superiority of the Pettingell line. These machines are also extensively used to do first class work in getting out body stock and frame work.

WRITE FOR CATALOGUE



NEW AUTOMATIC POWER HAMMER

Designed and made especially for Aluminum or Metal Body Work; gives plenty of room to form or turn body panels, seats, wide backs, etc. Is designed and built to run at a high rate of speed, and the peculiar construction with springs and belts preserves the bearings, pins and screws from racking or breaking.



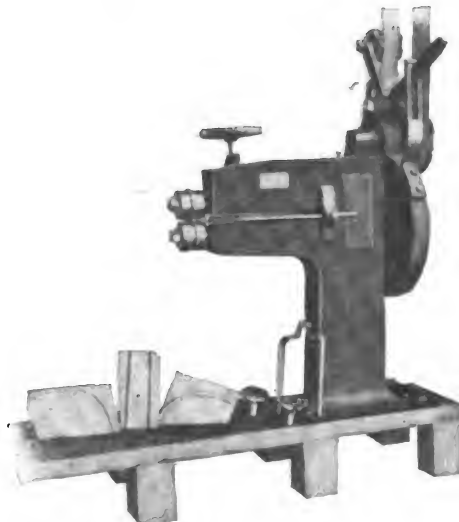
IMPROVED METAL ROLLER FORMER.

A solid, substantial machine, all metal, with cut gears. Will make any curve or various irregular curves on Mud Guards, Metal Panels, Seats, Etc.



HAND MOULDING OR BEADING FORMER.

Will form moulding or beading any size or shape, cuts all metals, will fold in wire around edge of metal and turn over flanges, etc. Intended for use in factories and shops where small machines are needed for much of the work that can be done quicker and easier than on large power machines, and also for many shops where they have not power or facilities or do not wish to put in the large, powerful and more expensive machines.



POWER MOULDING OR BEADING FORMER

A big improvement over any machines formerly used for forming, beading or moulding; cutting all metals; turning over flanges or folding in wired edge of metal, or any part of the work, and combines three machines in one. Adjustable every way and quickly changed for any work. Designed and built to handle all kinds of metal, aluminum, sheet steel, copper or tin.

THE PETTINGELL MACHINE CO.
AMESBURY, - - - - - MASSACHUSETTS

Please mention "The Hub" when you write.

BIG BUSINESS FOR FABRIKOID DEALERS

TRADE MARK
FABRIKOID LEATHER

AN IMPROVEMENT ON HIDE LEATHER for many purposes.
Costs less, no waste, water and vermin proof, uniform strength and thickness,
FULLY GUARANTEED, made in all grains and colors of hide leather, for upholstery,
wallpapering, automobile tops and cushions, screens, pillows, etc. Catalogue,
samples, prices and nearest dealer's name free.
FABRIKOID WORKS, Dept. No. 269, Wilmington, Del.
E. I. du Pont de Nemours Powder Co., Owner.

Over 10,000,000 Consumers

are reading the above advertisement. They are the regular readers of the twenty-one high-class magazines in which the advertisement, the second of a series of similar import, are appearing.

These people are going to use Fabrikoid because it has real merit and fills an actual need. They will demand it of you.

Get posted on Fabrikoid. Write to-day for illustrated Fabrikoid Catalog No. 269. It will be mailed promptly with full information, samples and prices. Address

FABRIKOID WORKS, WILMINGTON, DEL.

(E. I. du Pont de Nemours Powder Company, Owner)

LEATHER

— THAT DON'T CRACK —

That can't be distinguished from machine buffed hide.

That wears as well as expensive leather but costs much less.

Leather with these advantages is Diefenthaler's soft and pliable hides, and we guarantee that no oil will come out.

Made specially for carriage and automobile trimmings.

We will send sample hide for your approval without charge.

JOHN V. DIEFENTHALER
Hamilton, Bruen and McWhorter Sts.
NEWARK, - - NEW JERSEY



The main cause for the exceptional demand on MERITAS Leather Cloth is its durability.

It's a low-priced leather substitute you can depend on to give proper service without cracking.

In weights, finishes and colors for all carriage and auto purposes.

Sample book on request.

Ask your jobber for MERITAS Leather Cloth if quality counts.

Standard Oil Cloth Co.

320 BROADWAY

NEW YORK

Hotel Cumberland NEW YORK CITY



Broadway at
54th Street

**A Real Home
Luxurious
Comfortable**

Absolutely Fireproof

Hardwood floors throughout, covered with genuine oriental rugs, is a feature of the Cumberland which indicates the character of the entire establishment. Rare attention to homelike details eliminates the usual hotel atmosphere. Yet there is retained all the charm of hotel life—provision for every want immediately at hand, and at prices within the limits of the average income.

The Cumberland is within

A few steps of surface cars, elevated and subway. Eight minutes' ride of the best shopping districts. Ten minutes' walk of twenty theatres.

"Broadway" cars from Grand Central Depot pass the door.

Rooms with bath, \$2.50 per day, upwards

Write for Booklet To-day.

HARRY P. STIMSON, Manager



Bow Socket, No. 1004



Shifting Rail
No. 1115.

VEHICLE TOP FORGINGS

Of Every Description

No Need to Look Farther - Superior Goods
From One Factory in One Shipment.

For Buggy Tops, Auto Tops, Boat Tops

Write for Catalog F and Supplement
Secure Our Auto Gooseneck Hanger

CORTLAND FORGING COMPANY

CORTLAND, N. Y., U. S. A.

The Herbrand Company
Fremont, Ohio.

MANUFACTURERS OF
HIGH GRADE

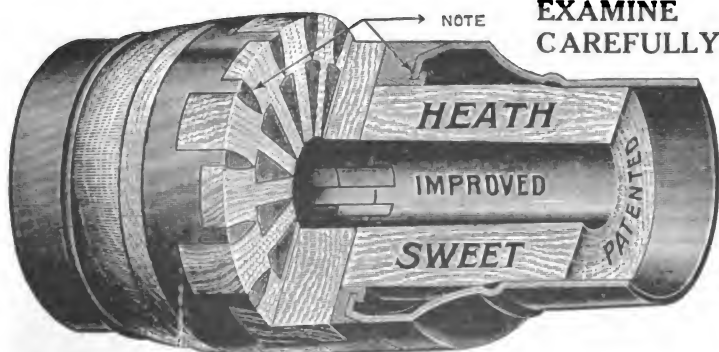
CARRIAGE AND AUTOMOBILE
FORGINGS

AND DROP FORGED WRENCHES

GEARS

We have Automobile
Gears for every purpose
in stock upon which
we can save you money.

FROST GEAR & MACHINE COMPANY
JACKSON, MICHIGAN



NOTE
EXAMINE
CAREFULLY

HEATH HUB

You Won't find a Flaw

Manufacture also

**SWEET
SARVEN**

**KENNEY
SHELL**

**WARENR
OOD**

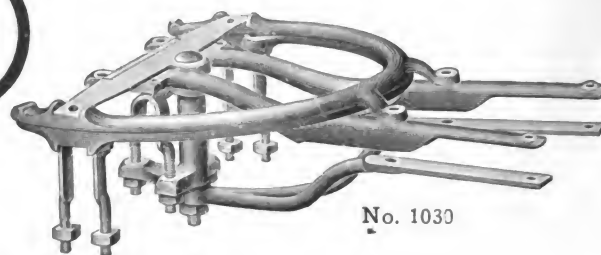
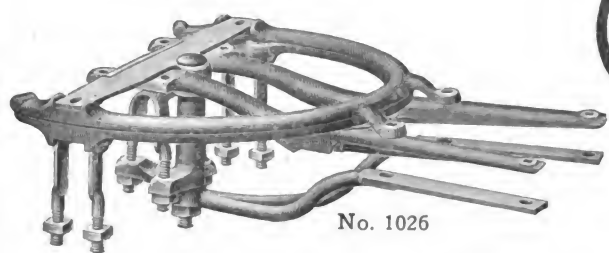
and

Automobile Wheels

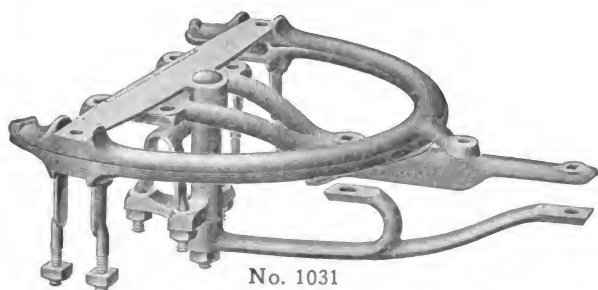
SHORTSVILLE WHEEL CO.,

Shortsville, New York

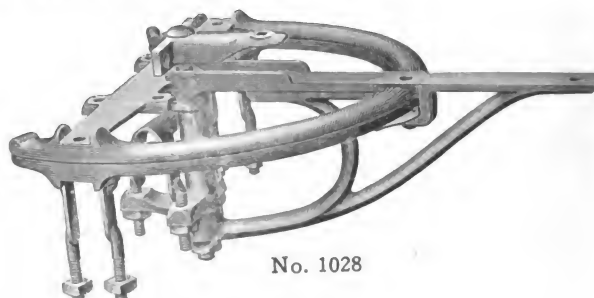
Please mention "The Hub" when you write.



Malleable Iron Fifth Wheels

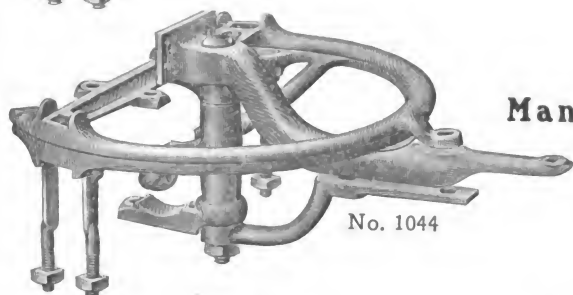
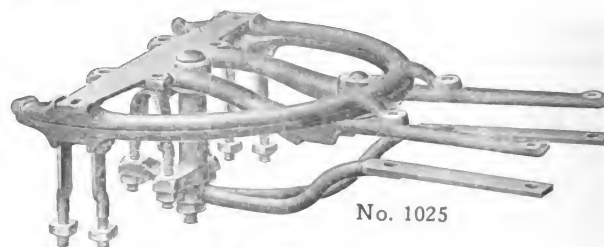
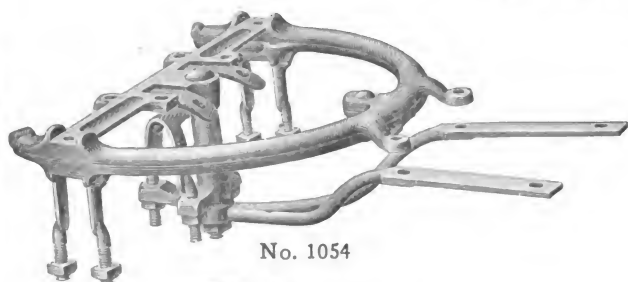


Made
by



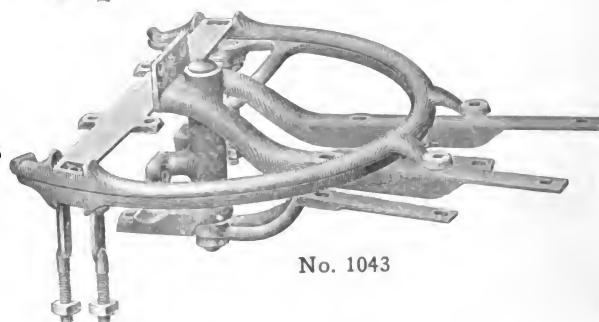
The Eberhard Mfg. Co.

CLEVELAND OHIO

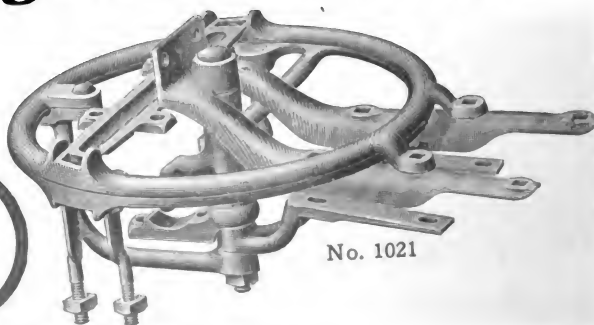
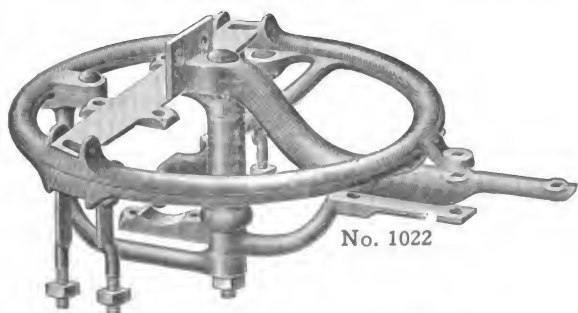


Manufacturers

of

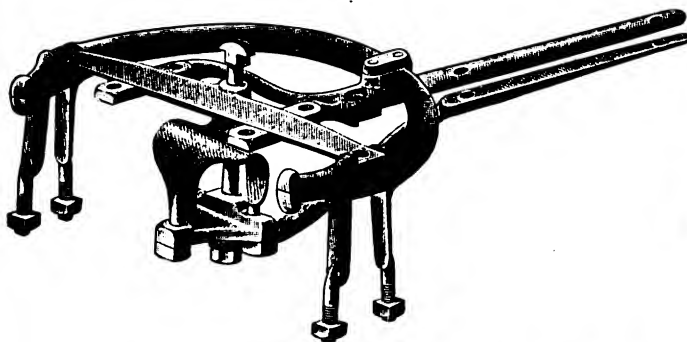


Carriage and Wagon Hardware

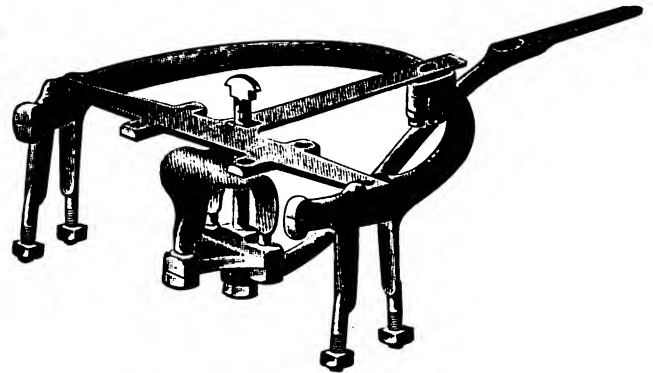


Please mention "The Hub" when you write.

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



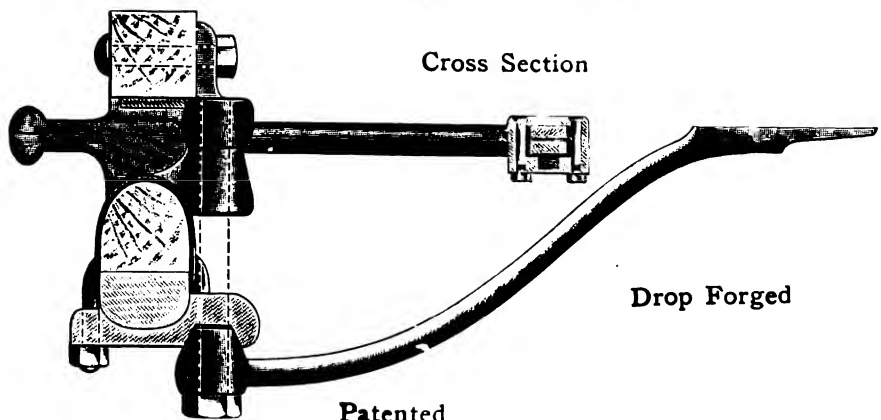
No. 1908—Gear Iron



No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

Double Locked in Head Block Plate and King Bolt Yoke. No Strain on Bolt. No Turn on Nut. Guaranteed.

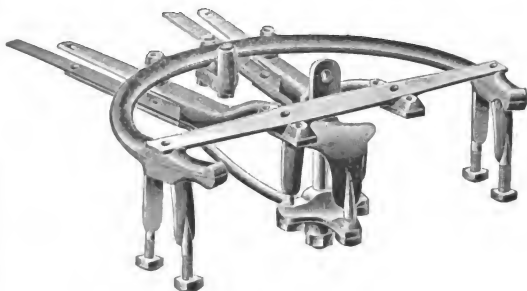


Cross Section

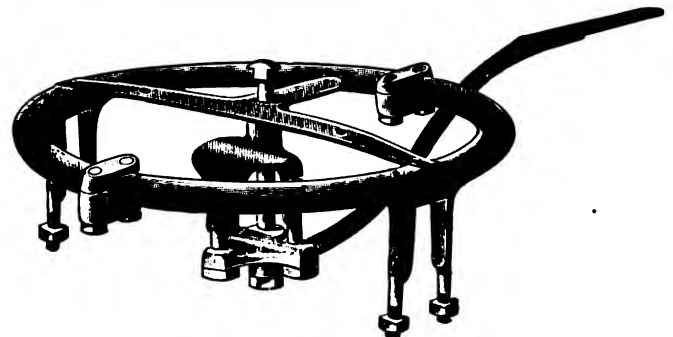
Drop Forged

Patented

SURE SAFE



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and that's good news involved in the handling of

THE RACINE AUTO TIRE.

We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

ROLLER CHAFE IRONS, VISES AND HARDWARE SPECIALTIES

Largest Manufacturers of Roller Chafe Irons in the World.
We have just what you want for any vehicle, and remember,
WE SHIP PROMPTLY.



No. 32—For end spring jobs with full length body loops.



No. 69—For Phaetons and Stanhopes.

We also manufacture the cheapest and most durable Automobile Muffler in the world. Can be easily attached to any automobile manufactured.

"We are Known as Prompt Shippers"

MOHAWK VALLEY MANUFACTURING CO.
UTICA, N. Y.

JOHN REILLY Inc.

Established 1865

MANUFACTURERS OF ALL GRADES OF

LEATHER

FOR THE

Carriage & Automobile Trade

**PARTICULAR ATTENTION CALLED TO
OUR AUTO SPECIAL**

FACTORIES,

**Avenues C & D, Murray & Astor Streets.
NEWARK, N. J.**

AGENTS,

Cincinnati—National Hardware Co., Fourth Street
Detroit—C. W. Findlater, No. 313 Forest Ave., West

CUSTOMER·A·SATISFIED·CUSTOMER

BECAUSE, those cup-like studs that you see in our illustration will grip the ground just where, and just when, the ground needs gripping; so that he is free from the danger of skidding and slipping.

BECAUSE, his tire EXPENSE account will show a difference such as will cause him to talk enthusiastically to others about you and the RACINE AUTO TIRE.

All this counts for good business; so get busy. The RACINE AUTO TIRE is going into the hands of live, pushing dealers. We shall make it equally advantageous to them as to us. Be amongst the live ones. Take our proposition. Do it now; and together let us do it thoroughly.

RACINE AUTO TIRE COMPANY

500 14th Street

RACINE, WISCONSIN



ROEHM & DAVISON

Established 1867

BUCKRAMS

DETROIT, MICHIGAN

LANDERS BROS. CO.

TOLEDO, OHIO

Importers and Manufacturers

BUCKRAM AND WEBBING

Transparent Celluloid, Bow and Stay Lining, Enamelled Muslins, Drills and Ducks, Cotton Sheetings, Burlap, Cushion Canvas, Wadding.

PROMPT SHIPMENTS

LOWEST PRICES

OIL CARPET

OILED DUCK



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
NEW HAVEN, CONN.

Richmond

*Built Exclusively
for the
Carriage Trade*

*Send for our original
designs and attractive prices*

RICHMOND MFG. CO
*Richmond
Indiana*

Lamps

ESTABLISHED 1855
PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

AUTOMOBILE WHEELS

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply the Standard Universal Quick Detachable and Quick Detachable Demountable Rims.

REPAIRING OF AUTOMOBILE TRUCK WHEELS.

SCHOFIELD & COMPANY

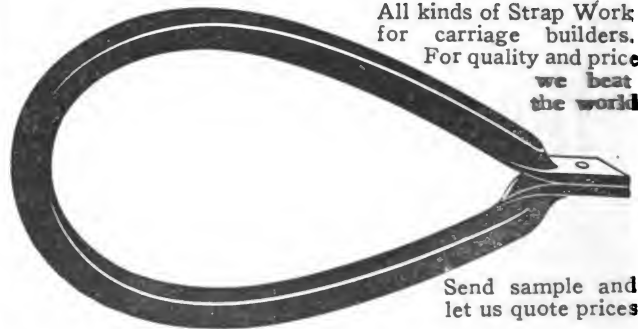
MANUFACTURERS OF

SCHOFIELD'S STEEL RUNNER ATTACHMENTS

FREEPORT, ILLINOIS

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES

All kinds of Strap Work
for carriage builders.
For quality and price
we beat
the world.



Send sample and
let us quote prices

J. C. DECKER :

Montgomery, Pa.

PORTER'S BOLT CLIPPERS

"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 inch.

H. K. PORTER,

EVERETT, MASS.

H. WEICHHOLD

L. D. Phone 2290-W Market

METROPOLITAN LAMP COMPANY

Manufacturing and Repairing of

AUTOMOBILE SEARCH and SIDE LIGHTS, COACH and CARRIAGE LAMPS

Makers of All Kinds of Metal Goods.

Nickle and Silver Plating

24 Mechanic St.,

Newark, N. J.

Please mention "The Hub" when you write.

DELPHOS HOOP COMPANY

MANUFACTURERS OF

HIGH GRADE BUGGY and AUTOMOBILE BOWS**Delphos, Ohio**

No Order Too Large Or Too Small. - - - Please Mention HUB

CHARLES L. DOWLER**CARRIAGE AND WAGON HARDWARE**

108 North Third St., Philadelphia, Pa.

CUSHION MANUFACTURER

Pure Stearic Acid Candles. Wheel Stock. Snow Flake Axle Grease. Bell and Keystone Telephone Connections.

QUALITY, STYLE, DURABILITY AND QUICK DELIVERY

**THE EDWARD STINSON MFG. CO.
VEHICLE WHEELS**

327-335 North Street - - - BALTIMORE, MD.

OHIO SEAT COMPANY**CARRIAGE AND AUTO WOOD WORK**

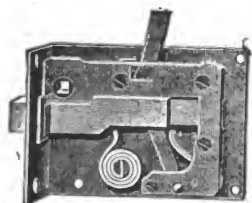
Seats of Every Description, Canopy and Cushion Frames, Buggy High Backs.

1964-66 CENTRAL AVENUE, . CINCINNATI, OHIO

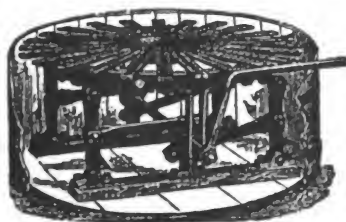
Special Carriage Trimmers Paste**GUARANTEED VERMIN PROOF**

Will Keep in Any Climate. Ask for Price on No. 38.

Mention The Hub.

BUCKEYE PASTE CO., - COLUMBUS, OHIO**A. OCHSNER & SONS CO.****1061 STATE STREET
NEW HAVEN, CONN.**

Auto and Carriage Locks, Hinges, Fixtures, Etc., and Body-makers' Tools.



The Bokop Tire Setter and Cooler is the Best and Only Machine that has stood the test during the last 12 years on all classes of work, and is the Only Machine built with the Indestructible Wrought Iron Face Plate.

Over 1,000 are in successful operation, repairs on which have not exceeded \$6.00 in the last 12 years. For prices, references and descriptive circulars, address **BOKOP, WEBB & PALM, Defiance, Ohio**

Richard Eccles Co., Auburn N. Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile, Special

Send for Catalogue No. 17.

THE "CRESCENT" BODY WORKS**Reading, Pa.**

Builders of

HIGH GRADE AUTO BODIES TO ORDER

Of Wood or Metal, in the White or Finished.

L. M. SMITH & SON**Leather****Carriage Furniture and Automobile****NEWARK, N. J.**

59-71 Lock St.

Office 59 Lock St.

234-236 Central Ave.

**METAL PARTS FOR MOTOR BODIES**

Hammered Work a Specialty

Fenders, Gasoline Tanks, Japanning Ovens

W. G. Burling

1924 Commerce Street, PHILADELPHIA, PA.


KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF**For Automobile Bodies and Parts**

It fills the pores of Metal and Wood perfectly. Sandpapers easily and produces a fine, smooth surface that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade**KEYSTONE PAINT AND FILLER CO., Muncy, Pa.**

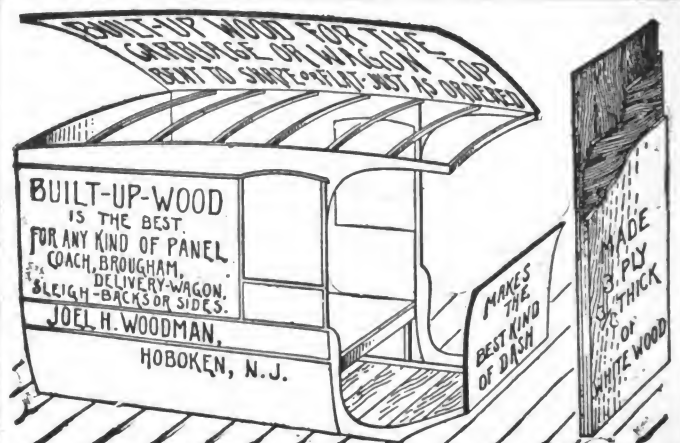
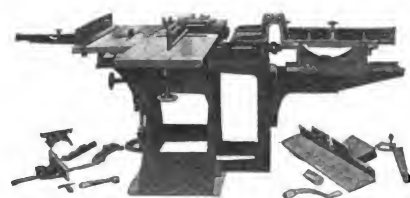


**The WEST Hydraulic Tire Setter
WILL CUT DOWN EXPENSE**

Tires set cold in one minute. This machine saves time — does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim and thus make the tire loosen prematurely. Saves re-sandpapering of wheels.

This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO., ROCHESTER, NEW YORK

4-in-1
A Substantially-Built, All-on-One-Arbor Combination.

Jointer, Saw, Boring and Tenoning Machine

Not too many machines in one—just enough.
Made with either 8 or 12-inch jointer.

Get our complete catalog of handy tools.

**BICKNELL MFG. & SUPPLY CO.
JANESVILLE, WIS.**

ESTABLISHED 1886.

Correspondence School of Carriage and Motor Carriage Drafting

A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

**Principal, THOS. MATTISON,
Hillside Avenue, Bitterne Park,
Southampton, England.**

Author of "The Coach Body Makers' Guide," \$3.00; a practical treatise on "The Suspension of Carriages," "Bookkeeping," and other carriage building works.

Jones Wheels
BEST ON EARTH

KANTSAMORE

**Phineas Jones & Co.
Newark, N. J.**




TRUCK BUILDERS

If you only realized the inestimable value of roller bearing fifth wheels on trucks, vans, delivery wagons and all other medium and heavy vehicles, no job would leave your shop without

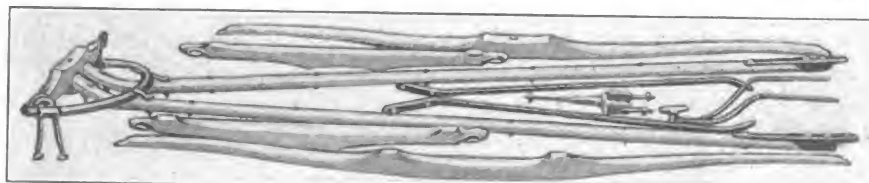
Roller Bearing Fifth Wheels

WHY? The adjustment is perfect. No oil or grease required. Almost indestructible. Will outwear any vehicle. Saves horseflesh and prolongs life of vehicle. Ask your jobber for the celebrated

NIELSON OR KING

Let us send you Catalogue and Price List.
**American Roller Bearing Fifth Wheel Co.
745 THIRD AVE., BROOKLYN, N. Y.**





The Buckeye Handle Gear & Bending Co.
ALLIANCE, OHIO
Manufacturers of Gear Woods
OUR OLD RELIABLE GEAR SET
The Most Complete Set on the Market. Write for Catalogue and Prices

**Subscribe
Now for**

THE HUB **\$2.00
Per Year**

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.



THE NOVELTY TUFTING MACHINE

is a device that meets any and all requirements in the upholstering of Cushions, Backs, and other parts where upholstering is required.

It takes up very little space; can be run by hand or power, as desired, and is so simple a boy can learn to operate it in an hour's time.

It is adapted to any grade of material or filler and we guarantee uniformity of design, using the smallest possible material allowance.

Ask for further particulars and our time-payment proposition.

NOVELTY TUFTING MACHINE COMPANY

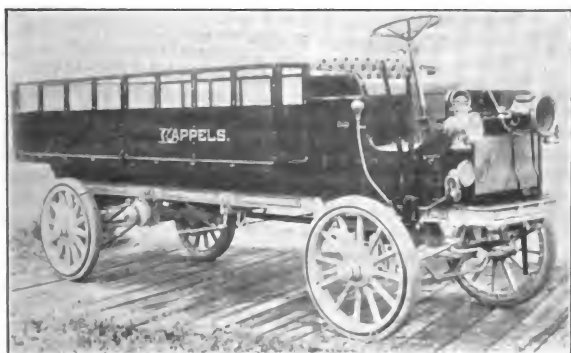
1200 Michigan Avenue, CHICAGO, ILLINOIS



BOLTS Rivets, Carriage Makers' Washers
and Burrs for all kinds of Vehicles
Russell, Burdsall & Ward Bolt and Nut Co.

Main Works, PORT CHESTER, N. Y.

Branch at Rock Falls, Ill.



The GRAMM is made in 1-Ton, 2-Ton, 3-Ton and 5-Ton models.
Ask Us To-day for the Latest GRAMM Literature.

GRAMM A Double Winner in the Longest and Toughest Contest Motor Trucks Have Had.

The most severe and conclusive contest ever given motor trucks in this country or abroad was the Chicago to Detroit and return, 756-mile run, in August last.

The GRAMM won two cups, excelling in the 2-ton and 5-ton classes.

The GRAMM has always shown its efficiency in every contest which was based upon reliability and economy.

THE GRAMM MOTOR TRUCK COMPANY
107 South Lima Street, LIMA, OHIO, U. S. A.

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO.
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



No. 263-N with Nickel Rail.

ARE YOU IN LINE

With the Leaders for 1912?

THEY WILL USE DASH RAILS

Welded Solid To The Dash Frame

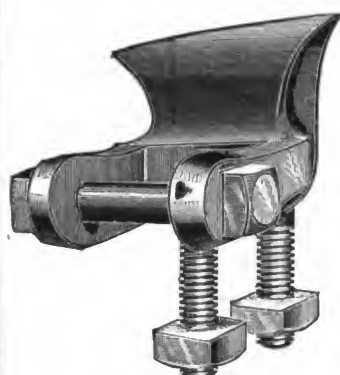
Skewed Shaft Couplings

Regular or Oval Patterns
For High Arched Axles

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{3}{8}$ or $\frac{1}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



A. H. WIGGERS
Pres. and Mgr.

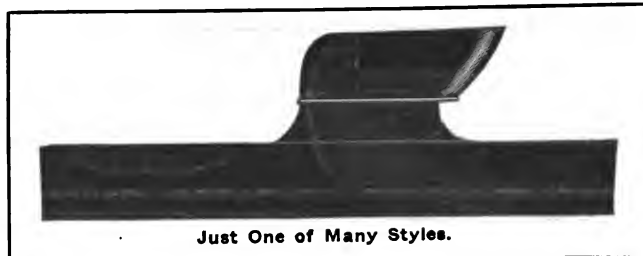
H. H. WIGGERS
Sec'y and Treas.

E. S. WIGGERS
Vice-Pres.

WIGGERS' BODIES

Automobile - Carriage

MERIT CONSIDERATION



Just One of Many Styles.

Because { THEY HAVE { Style
 { AND ARE { Quality
 { Symmetrical Outlines
 { Well Seasoned
 { Made to Wear
 { Priced Right

Address
THE WIGGERS COMPANY

Manufacturers of Carriage
and Auto Bodies and Seats

1417 to 1423 Plum St.

Cincinnati, Ohio

The Higgin

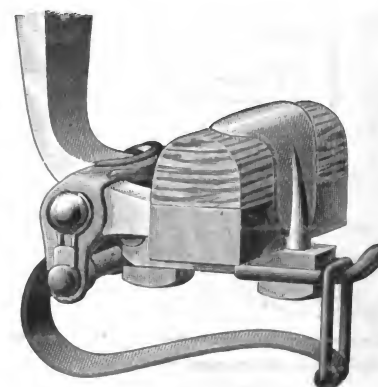
LINE OF CARRIAGE TRIMMINGS

KNOBS



No. 70.

No. 133



(Closed.)
The Higgin Quick Shifter.

KNOBS



No. 72.

No. 130.



Full Leather Nut



No. 74.



Black Japan Nut

QUALITY UNSURPASSED.

Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co.

Newport, Ky.

The Hub



TRADE NEWS PUBLISHING COMPANY
24-26 MURRAY ST., NEW YORK

CURLEY

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN

STAR or KENNY

Sweet Concealed Band

WOOD HUB

WARNER

WHEELS

HEAVY and LIGHT
for

CARRIAGES

WAGONS and

TRUCKS

IF YOU WANT THE BEST TRY OURS



Load—Ten Tons of Coal.

SOLVED! Is the way motor car experts express themselves on the subject of tires for commercial motor vehicles after seeing and using the

KELLY-SPRINGFIELD SECTIONAL TIRE

With a grip on the road that means progress and security from the fault of solid tires—that of crowding the rubber ahead under load, which means disintegration—the motor wagon and truck owner will find in the Kelly-Springfield Sectional Tire the best tire for all heavy cars. Each section is dependent upon itself. If interested, write

CONSOLIDATED RUBBER TIRE COMPANY

New York, N. Y., and Akron, Ohio

Branches: Boston, Chicago, Philadelphia, St. Louis, Detroit, Cincinnati, San Francisco.



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT,  ACORN,  and STAR  BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO.

RICHMOND, VA.

For Export Prices apply to the New York Office.

The Fact that Timken Roller Bearing Axles are Adjustable for any and all Wear

Lengthens Their Life

and makes them both the best and easiest anti-friction axles to sell.

Are you selling as many vehicles and wagons with TIMKEN ROLLER BEARING AXLES as you might? In other words, are you getting all the profit you should have? If not, why don't you tell wagon buyers who don't know that

TIMKEN ROLLER BEARING AXLES

Reduce the draft 50% Save the horses
Increase earning power of wagons, improve delivery service, are dependable, prevent hot boxes and delays, requiring oiling only once a month.

GUARANTEED FOR TWO YEARS
SEND FOR CATALOG AND PRICE LIST

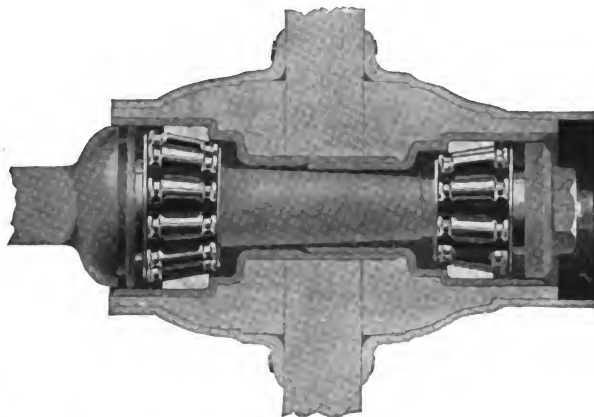
The Timken Roller Bearing Co.,
CANTON, OHIO

Note. -We also make Roller Bearings for all Automobile Applications.

Note. -Pleasure and Commercial Car Axles with TIMKEN ROLLER BEARINGS furnished by **The Timken-Detroit Axle Co., Detroit, Mich.**

Branches: 68th & Broadway, New York. 1347 So. Michigan Ave., Chicago.

The F-S Co.



VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Please mention "The Hub" when you write.

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York, Chicago, Minneapolis, Kansas City

WHY STANDARD UNIVERSAL RIMS ARE ESSENTIAL

To The Car Builder, The Tire Maker and Auto Owner



A Flat Tire.



A Minute for Adjustment.



Then On Your Way.

IN the standardization of a universal type of rim, one of the most marked steps in solving the perplexing tire problem has been accomplished. STANDARD UNIVERSAL RIMS represent 96% of the automobile manufacturers in the country, who have contracted for their wheel equipment.

The great significance of this fact at once makes itself apparent. With the STANDARD UNIVERSAL RIM, the automobile manufacturer's salesman at once has the attention of his customer when he points out the benefits of a one-type rim equipment; in fact popular opinion is so strong that we often hear the question asked in sales agency offices: "Does your car have the STANDARD UNIVERSAL RIM?"

The car owner is the man who is ultimately benefited. He is the fellow who suffers the tire trouble on the road and has to pay for it in time, money and patience.

STANDARD UNIVERSAL RIMS are an amalgamation of the leading features of the Continental, the Goodyear, Diamond (Marsh) and Goodrich. You at once recognize these makes, think of all their best features assembled into one rim and the efficiency of that rim.

STANDARD UNIVERSAL RIMS Fit All Tires

Go anywhere and you are never held up on account of estranged makes. STANDARD UNIVERSAL RIMS reduce tire trouble to its minimum and save in tire mileage their cost the first year.

The tire manufacturer is benefited for it means less troublesome tire adjustments. The greatest tire makers in the world use STANDARD UNIVERSAL RIMS and guarantee their tires for that reason.

STANDARD UNIVERSAL RIMS are sold everywhere. Insist upon the STANDARD UNIVERSAL type. If your local dealer does not have them send the size of your wheels and tires. We will furnish you with an estimate on the cost of making the change.

Write to-day for further descriptive information.

THE UNITED RIM COMPANY, AKRON, OHIO

Please mention "The Hub" when you write.



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

¶ Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
NEW HAVEN, CONN.

Richmond

*Built Exclusively
for the
Carriage Trade*

*Send for our original
designs and attractive prices*

RICHMOND MFG. CO.

*Richmond
Indiana*

Lamps

Push Your Business With Our Free Ad. Service

You are entitled, if you are a user of Valentine Varnishes, to our series of automobile and carriage painting advertisements for your local paper.

These ads. have been written and displayed by one of the foremost advertising men in the business, and are the **best** that we can procure to advertise carriage re-finishing work.

We know from our experience of many years that they will promote your business.

You get free the exclusive services in your town of an expert high-priced advertising man, and plates for the series of ads., ready to put into your paper, with your name at the bottom.

The ads. are pointed and convincing. They are set in a **different** style that is certain to attract attention.

They will secure new customers and get action from old ones. They will get you business **now** that otherwise might be postponed for months—or go to someone else.

They are **quality** ads., which means that they will get you the best **class** of business and help you to **maintain prices**.

The cost to us of the series has been heavy. We expect to be amply repaid, however, by your increased consumption of varnish. If you don't get a lot of extra work from the ads. we shall lose money on them. Our business was originally built by advertising, backed by quality. It is the modern way. Advertising will push your business handsomely.

Fill out the coupon and we will send you proofs of the series of thirteen ads. You need then only mark such as you want and we will forward them to your local paper.

**VALENTINE
& COMPANY**

257 Broadway, NEW YORK
343 S. Dearborn St., CHICAGO

V.V.B.
Name.....
Address.....
Town.....
State.....
Cut off & mail to
Valentine & Company

Please mention "The Hub" when you write.

BIG BUSINESS FOR FABRIKOID DEALERS

TRADE MARK FABRIKOID LEATHER



For Artistic, Sanitary Wall-Covering in
Dens, Living Rooms, Halls and Libraries

The living room illustrated has walls covered with maroon embossed Fabrikoid Leather, wood-work and panel strips in antique oak. Its charming effect can be duplicated at small cost in any home, in any color desired, in embossed or grain effects. Fabrikoid Leather is an improvement on hide leather for upholstering, automobile and carriage tops, curtains and cushions, screens, pillows, suit cases, etc.

Catalog, price list and dealer's name on request
FABRIKOID WORKS, Dept. No. 269 Wilmington, Del.
E. I. Du Pont de Nemours Powder Co., Owner.

Over 10,000,000 Consumers

are reading the above advertisement. They are the regular readers of the twenty-one high-class magazines in which the advertisement, the second of a series of similar import, is appearing.

These people are going to use Fabrikoid because it has real merit and fills an actual need. They will demand it of you.

Get posted on Fabrikoid. Write to-day for illustrated Fabrikoid Catalog No. 269. It will be mailed promptly with full information, samples and prices. Address

FABRIKOID WORKS, WILMINGTON, DEL.

(E. I. du Pont de Nemours Powder Company, Owner)



The main cause for the exceptional demand on MERITAS Leather Cloth is its durability.

It's a low-priced leather substitute you can depend on to give proper service without cracking.

In weights, finishes and colors for all carriage and auto purposes.

Sample book on request.

Ask your jobber for MERITAS Leather Cloth if quality counts.

Standard Oil Cloth Co.

320 BROADWAY

NEW YORK

LEATHER

— THAT DON'T CRACK —

That can't be distinguished from machine buffed hide.

That wears as well as expensive leather but costs much less.

Leather with these advantages is Diefenthaler's soft and pliable hides, and we guarantee that no oil will come out.

Made specially for carriage and automobile trimmings.

We will send sample hide for your approval without charge.

JOHN V. DIEFENTHALER

Hamilton, Bruen and McWhorter Sts.

NEWARK, - - NEW JERSEY

Hotel Cumberland NEW YORK CITY

Broadway at
54th Street



**A Real Home
Luxurious
Comfortable**

Absolutely Fireproof

Hardwood floors throughout, covered with genuine oriental rugs, is a feature of the Cumberland which indicates the character of the entire establishment. Rare attention to homelike details eliminates the usual hotel atmosphere. Yet there is retained all the charm of hotel life—provision for every want immediately at hand, and at prices within the limits of the average income.

The Cumberland is within

A few steps of surface cars, elevated and subway. Eight minutes' ride of the best shopping districts. Ten minutes' walk of twenty theatres.

"Broadway" cars from Grand Central Depot pass the door.

Rooms with bath, \$2.50 per day, upwards

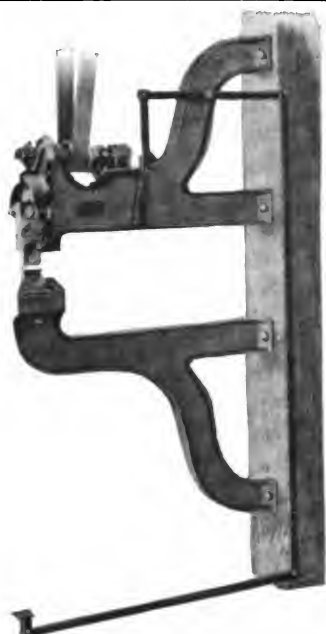
Write for Booklet To-day.

HARRY P. STIMSON, Manager

METAL BODY MACHINERY

of PETTINGELL PATENTS forms the largest, if not the entire equipment of most every automobile body plant in the United States. This surely denotes superiority of the Pettingell line. These machines are also extensively used to do first class work in getting out body stock and frame work.

WRITE FOR CATALOGUE



NEW AUTOMATIC POWER HAMMER

Designed and made especially for Aluminum or Metal Body Work; gives plenty of room to form or turn body panels, seats, wide backs, etc. Is designed and built to run at a high rate of speed, and the peculiar construction with springs and belts preserves the bearings, pins and screws from racking or breaking.



IMPROVED METAL ROLLER FORMER.

A solid, substantial machine, all metal, with cut gears. Will make any curve or various irregular curves on Mud Guards, Metal Panels, Seats, Etc.



HAND MOULDING OR BEADING FORMER.

Will form moulding or beading any size or shape, cuts all metals, will fold in wire around edge of metal and turn over flanges, etc. Intended for use in factories and shops where small machines are needed for much of the work that can be done quicker and easier than on large power machines, and also for many shops where they have not power or facilities or do not wish to put in the large, powerful and more expensive machines.



POWER MOULDING OR BEADING FORMER

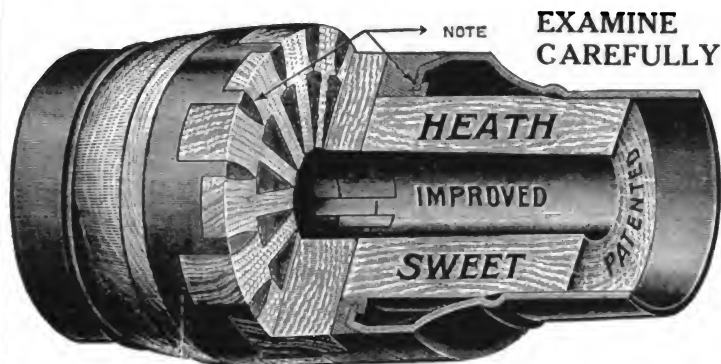
A big improvement over any machines formerly used for forming, beading or moulding; cutting all metals; turning over flanges or folding in wired edge of metal, or any part of the work, and combines three machines in one. Adjustable every way and quickly changed for any work. Designed and built to handle all kinds of metal, aluminum, sheet steel, copper or tin.

THE PETTINGELL MACHINE CO.

AMESBURY,

MASSACHUSETTS

Please mention "The Hub" when you write.



EXAMINE
CAREFULLY

HEATH HUB

You Won't Find a Flaw

Manufacture also

**SWEET
SARVEN**

**KENNEY
SHELL**

**WAREN
OOD**

and

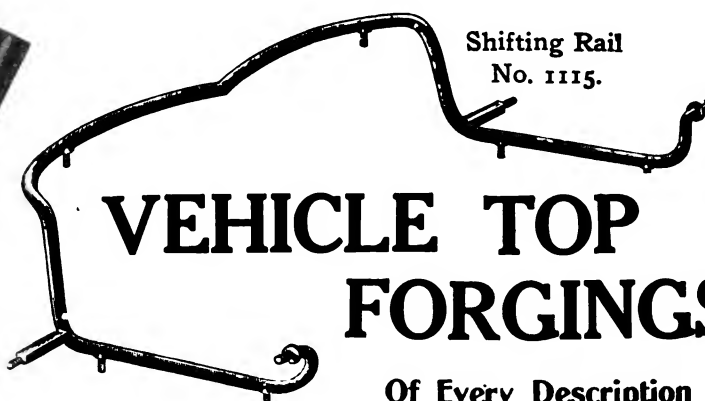
Automobile Wheels

SHORTSVILLE WHEEL CO.,

Shortsville, New York



Bow Socket, No. 1004



Shifting Rail
No. 1115.

VEHICLE TOP FORGINGS

Of Every Description

No Need to Look Farther - Superior Goods
From One Factory in One Shipment.

For Buggy Tops, Auto Tops, Boat Tops

Write for Catalog F and Supplement
Secure Our Auto Gooseneck Hanger

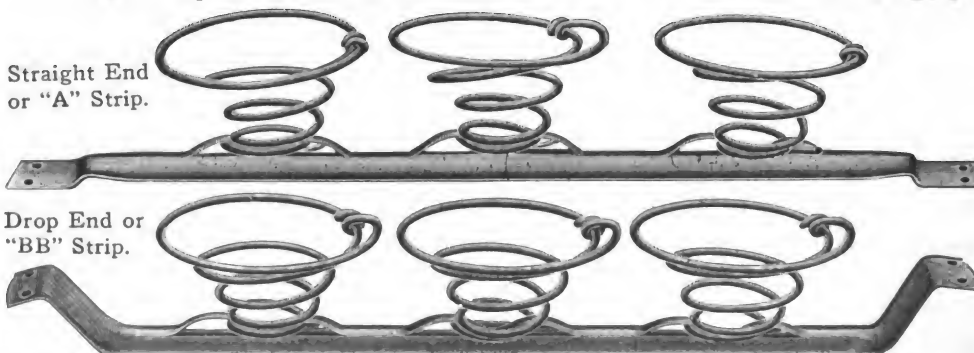
CORTLAND FORGING COMPANY

CORTLAND, N. Y., U. S. A.

MURRAY'S PATENT CUSHION STRIP CONSTRUCTION

We sell 90% of
the carriage trade
15,000,000 sold in
the last ten years.
That is going
some.

The reason—
Price—Quality—
Quick Shipments.



We can take care
of a few more
contracts but you
must hurry. We
also manufacture
special auto con-
structions. Write
for details. Are
you a customer?

MANUFACTURED BY THE WM. A. MURRAY SPRING CO., CINCINNATI, OHIO

Please mention "The Hub" when you write.

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

NOVEMBER, 1911.

No. 8.

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, *President.* G. A. TANNER, *Secretary and Treasurer.*
24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00

AMERICAN HARNESS AND SADDLERY

DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

American Invasion.

The Olympia show in London has set the British trade tongue wagging about the "American Invasion," referring to the influx of a few low-priced, small-powered automobiles that seem to take the fancy of the buyer.

The lowest priced native car sells for about double the quoted prices of the Yankee car, so it opens up a field of trade by catering to a class who were carless and hopeless of becoming owners before the present price level was made.

There appears to be no harmful criticism of the car at the price. It is lacking in finish and details that are desired, but the price makes amends, when it is shown that the car will stand up and do its duty in its everyday clothes, hence evening dress may be excused, putting the argument that way.

The British maker fairly states the American work is not unsalable trash and concludes it behooves him to consider seriously what he is up against in the way of severe competition.

We do not look at it in quite this light, but rather that the American maker has had the sagacity to notice that a

large buying field was fallow and uncultivated by the Britisher, so it was fair to suppose a crop might be gathered from the unworked territory. The results are justifying the theory according to reports.

The market affords a very agreeable outlet, and may be the answer to the very apparent congestion that is noticed in this country at the present time.

Interesting Move.

The implement and buggy dealers through their associations recently held a fair in Peoria, said to have been most successful.

The point of especial interest is that the fair was under the control of these men, and as a result space was refused to catalogue houses, which, it seems, have made it a point to seek representation at such places to show farmers and other visitors the beauties of trading by mail. The idea was protection for the dealer, and it would appear from the news reports that the idea was triumphant.

Suspension is the Thing.

The comfort of a passenger vehicle depends on how the body is placed on the running parts. The ease is due to the adjustment and disposal of weight, and the correct balance. The quality of the springs plays a star part. So well had the horse vehicle builder studied this problem he succeeded always, if a master of his craft, in making a vehicle a most comfortable conveyance for the passenger despite steel-tired wheels. Air-cushioned tires were not in his dreams, even.

The builder had to accomplish such a result because the pleasure and comfort of the buyer were the goodwill of his business.

The old-fashioned builder studied the disposal of weight, he considered the load to be carried, and he achieved all that was wanted.

How topsy-turvy it all became when the engineer took hold of the motor running parts and started in to do things. His rigid frame was provided with suspension just so and so without regard to ultimate position or extent of load, two-passenger, so-called limousine, or what not, the springs were just made stronger for additional weight by adding more plates to the springs. This is the same way he would go about strengthening a truss bridge. The proposition of fixed load did not vary. No one ever heard of adjusting the load in a motor vehicle. It isn't done. The length, breadth, etc., of springs are not altered after the specifications are once made.

So to get this ease the passenger thinks he must have

the tires filled with air, and made big or bigger. If that won't answer then the upholstery springs are made of feather-bed proportions so that the passenger is dumped into the softest, most yielding and most spine-distorting arrangement, to apologize for the rigidity found elsewhere.

Is this the best that can be done? We think not. We believe the carriage builder will evolve something different and better in the matter of body suspension when he becomes seriously interested.

Strains and Stresses.

A piece of oak 24 feet long will only support half the weight of a piece 12 feet long, supposing they are both supported at the extreme ends and are both of the same depth and breadth; but, if a weight be allowed to fall suddenly on each, the longer one will resist a weight twice as heavy as the shorter. If the shorter piece breaks with 3 cwt. falling 10 feet, the longer one would only break when 6 cwt. falls 10 feet, or 3 cwt. 20 feet. It therefore goes to show that it depends entirely at what distances the supports are placed. If it should be a long body the distance of supports would be greater, and would necessarily require timbers of a greater size to withstand the same amount of weight as one where the supports are at a much closer position. Another important feature is that several pieces of timber braced together will withstand a greater weight than one piece which is of the same measurement in the whole.

Against this we have to consider that a number of holes have to be bored through each piece for the purpose of fixing the various parts, which must naturally weaken them to some degree. The crushing strain that a piece of oak will stand is about 10,000 lbs., or roughly speaking, $4\frac{1}{2}$ tons per square inch, so there is little to fear in that respect. A piece of oak 1 inch square and sustained by supports 24 inches apart, and a weight being applied in the middle, will break under a pressure of 350 lbs., or a little over 3 cwt. So, by having pieces as main sides 3 in. by 2 in., two in number, and pieces for summers, 2 in. by 2 in., four in number, would be equal to twenty-eight of the pieces 1 in. by 1 in.; and, suppose the former to be supported at a distance of 24 in. apart, and in addition being braced together, they would support a load of four tons easily, without any fear of breaking. From the above formula a reasonable calculation can be made of the size of timbers required for various loads to be carried, assuming, of course, that the heartwood only is used.

Just So.

According to W. H. Emond, chief designer for the H. H. Franklin Manufacturing Company, American manufacturers are beginning to realize the necessity of paying strict attention to the styles of design more than ever before.

Just before leaving for an extensive European trip to study foreign designs in motor cars, Mr. Emond said: "I expect to visit a great many factories and a great many

designers while I am away, but I shall pay particular attention to the work of Louis Dupont, of the French school of coach design. He is, I believe, the greatest automobile coach-work designer in the world to-day. France undoubtedly leads in automobile coach designing, with Germany second and England third.

"The advent of the motor car has given the automobile coach designer a greater latitude than he ever possessed during the best days of the horse-drawn vehicle. In fact, the automobile coach designer is just entering upon a new field of labor. So much time has been spent in perfecting the modern gasoline motor and applying it to the automobile that little attention has been paid to beauty of lines until within the past two years.

"Meanwhile, foreign makers have been devoting almost as much time to body designing as they have to motor perfecting. As a result they are far ahead of America in beauty design."

What Mr. Emonds says is true. The Hub has had much to say on the same subject when it was a very lonely minority of one. The American journals interested were very optimistic about all matters American, but failed to be discerning beyond the tips of their noses. We expect to hear the news now in many keys since the trade tuning fork has sounded a key-note.

This is a pertinent place to call attention to the possibilities of our Technical School for Carriage Draftsmen, and the aid it can render to those groping for style and individuality of expression in wood and metal.

A select few of New York's coachbuilders have not been open to criticism. An inspection of built-to-order automobile body work shown in their repositories has shown most charming examples of taste, elegance and originality, but the ordinary "tin caps" as one observer put it, are no credit to their creators. It will all change for the better some day.

Everything is Promotion.

It is suggested that an organization, national in scope, ought to be launched. The object is to promote the use of horses and more horses; to breed, to refine, and generally to "protect" this species of motor power.

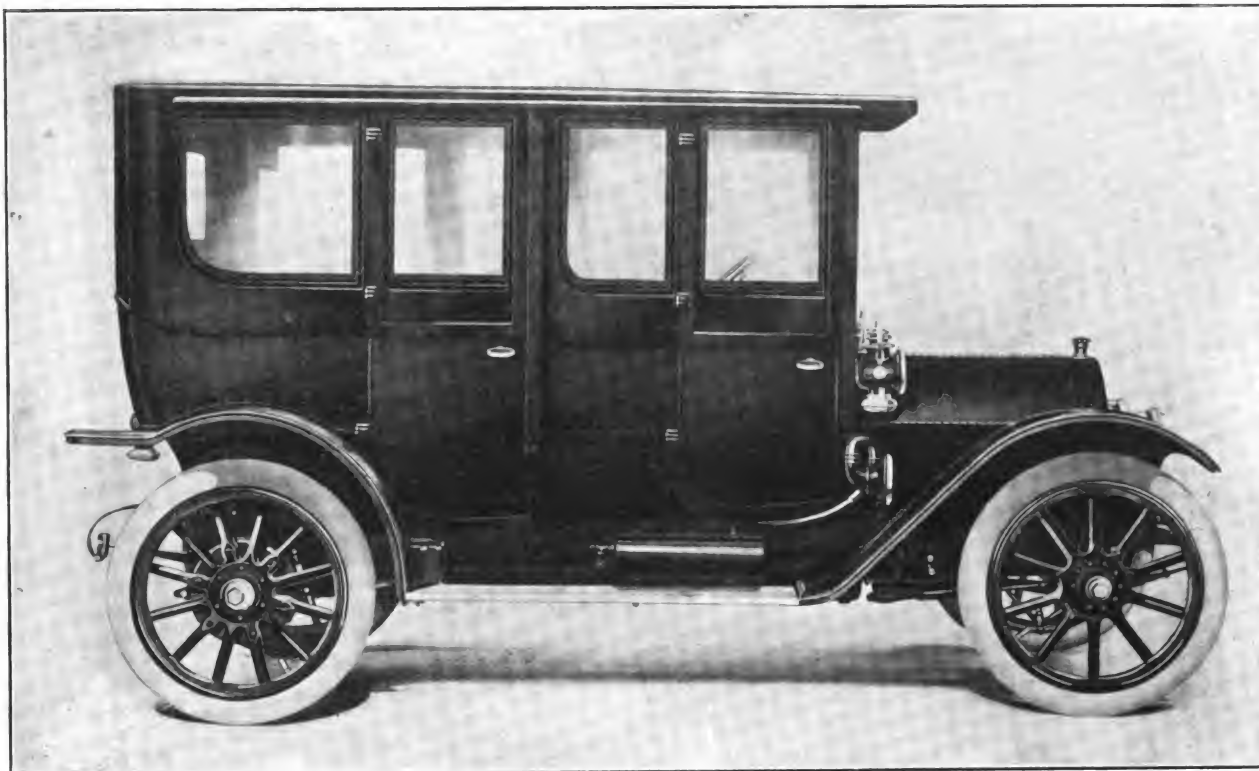
We are great people for doing things by organization and association. We appreciate the work of the special interest.

We also have great faith in the efficiency of law. We manufacture more law, the country over, than any people on the map—and we make ourselves amenable to a very small fraction of such enactments.

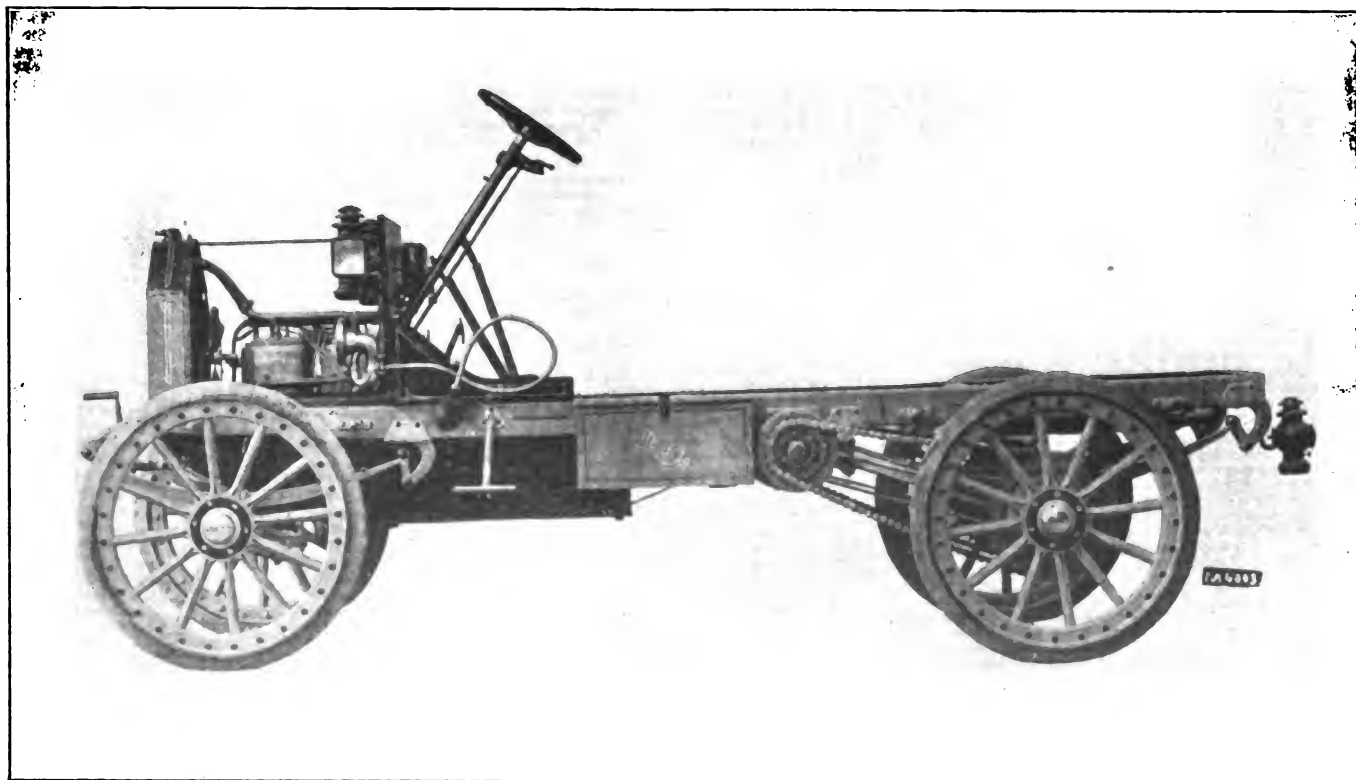
There is one primal, world-old law that is working all the time, but it is too outgrown for our consideration. Its enacting clause is never left out of any commercial conditions. There never were, nor will be, fewer horses than are needed, because the price rises when the supply is scant, and self-interest for a profit gets busy at once. Half the scarecrows that have been erected in the fields of human progress to frighten away man's faithful friend have, figuratively, been eaten by the aforementioned friend, thus waxing fat and multiplying on the face of the earth.

Organize to make it possible for the horse to do his work even better and cheaper than now, and there will be horses in plenty for all demands, likewise mules.

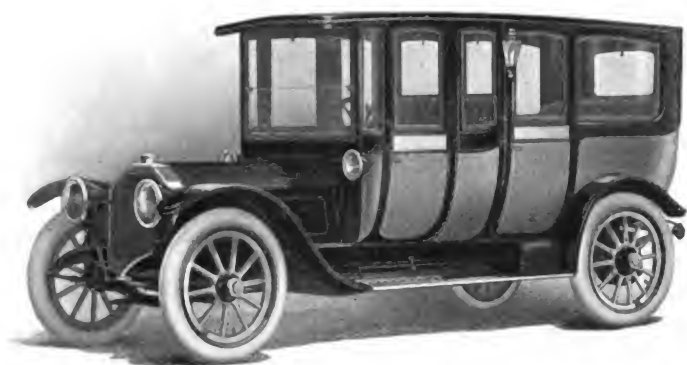
Vehicle Fashions For November, 1911



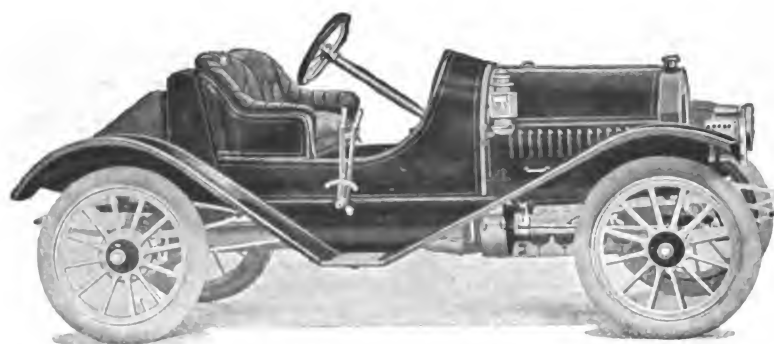
HANDSOME LIMOUSINE.
Chalmers Motor Co.



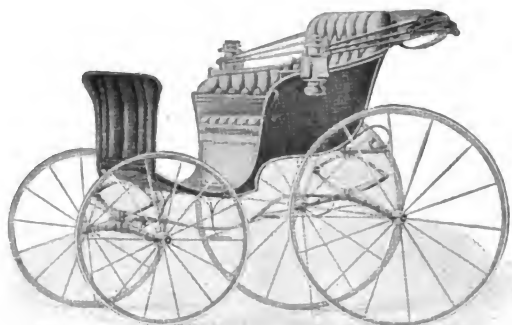
CHASSIS SHOWING CONSTRUCTION USED BY
Bowling Green Motor Car Co.



TWO EXAMPLES OF BEAUTIFUL CARS.
Peerless Motor Car Company.



SOMETHING NICE IN ROADSTERS.
Jackson Automobile Co.



Central Park Phaeton.



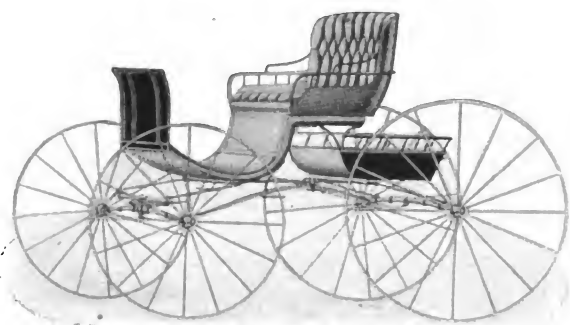
Cut-Under Runabout.



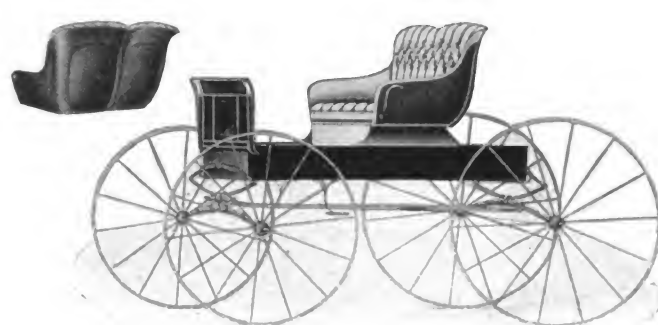
Sunk-Panel Auto-Seat Buggy.



Piano-Box Buggy.



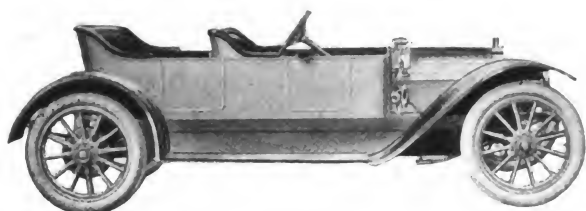
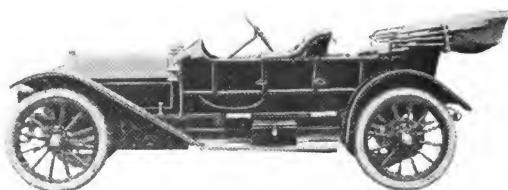
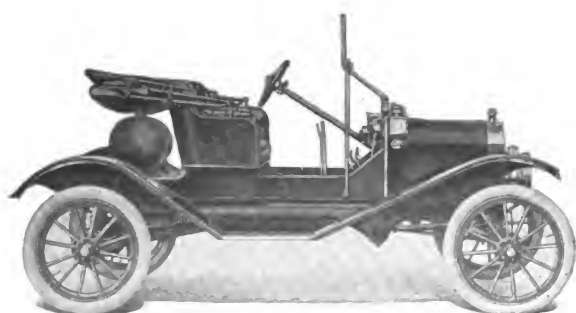
Center-Spring Cut-Under Runabout.



Sunk-Panel Runabout.

MINIATURE ILLUSTRATIONS OF GOOD WORK

Made by The George Delker Co.

**The Avery Co.****The Avery Co.****The Adams Co.****Otto Motor Car Co.****McFarlan Motor Car Co.****Ford Motor Co.****Ford Motor Co.****Ford Motor Co.**

Tri-State Dealers' Convention and Exhibit.

Detailed Report of Proceedings.

The first session of the thirteenth annual convention of the Tri-State Vehicle and Implement Dealers' Association was called to order in the Music Hall, Cincinnati, O., October 24, by President George P. Wagner. The minutes of the last convention were read and approved, following which President Wagner delivered his annual address.

PRESIDENT'S ADDRESS.

To the dealers in attendance who are not members we extend a most hearty welcome especially if you join our association. We need and want your membership. If every dealer were a member, I know our business relations would be more pleasant and profitable. Our growth the past year has been healthy but we still have a large number of dealers in our territory who are not members. I would suggest that each member make it his duty to obtain at least two new members in the coming year. We owe much to the manufacturer for being loyal in making exhibits in the past, and for filling this large music hall with one of the finest exhibits ever held. Dealers should appreciate this loyalty and purchase as many goods as they can see their way clear during this convention. The exhibitors are true to the dealers and the best of feeling should be cultivated between the manufacturer and dealer. Our interests are mutual and a hearty co-operation is necessary. Their success depends on our business being put on a profitable basis.

C. M. Johnson, of Rush City, Minn., a member of the Cost Educational Association, will present this important subject Wednesday evening. I consider this question of vital importance, and hope every dealer will attend this lecture. I would suggest that the able committee appointed by this association at the last session join with the secretary and line out their campaign and push this work the coming year by mailing literature on this subject as often as they deem it necessary, to every dealer in the three states. The dealers want to make money. If they were posted on the actual cost of doing business the failures would be fewer.

A few local clubs were organized during the past year. This question will be brought before you at the Wednesday evening meeting by members of the locals organized.

I would recommend that a committee of two dealers from each state be appointed to act with the secretary as a committee on state legislation.

This association has in the past made its fight against the passage of parcel post by working in conjunction with the Federation and other retail organizations. Up to the present time the bill has not been reported from the committee on post offices and post roads, but from present indications there will be a hard fight made to compel the committee to report the bill this session of Congress. I would advise every dealer to get in touch with his Congressman and Senator; let him know that he is opposed to the passage of parcel post in any form.

The trade press has done much for the implement and vehicle dealer. It is doing all in its power to put the dealer on a profitable basis. You must keep yourself informed if you want to be up-to-date. The dealer should appreciate what the press is doing for him and subscribe for several trade papers. Your money will be well invested.

I have to the best of my ability served you as president in the past year, and I wish to thank you for the honor conferred upon me. I appreciate the courtesy of every member, and feel grateful to the officers and committees for their hearty co-operation and assistance.

SECRETARY'S REPORT.

Secretary Rathbun said: The past year has been the most fruitful in our history in the number of new members received. Since October 1, 1910, we have added to our rolls 165 new members. We have lost some members by discontinuance, change in business and lack of interest. Your association is now, however, the second largest of its kind in the United States, numbering beyond five hundred firms actively engaged in the retailing of vehicles or implements, and in influence and respect of the trade, is one of the very foremost in organized effort.

As the term for reporting to our convention must end October 1, one year's report must needs show parts of two exhibit years. The actual year of Tri-State officers ends December 1, Your actual net worth, at close of 1910 exhibit was \$6,484.69, which was a profit for the year Dec. 1, 1909, to Dec. 1, 1910, of \$855.47. The amount collected by your secretary, Oct. 1, 1910, to Oct. 1, 1911, was \$11,646.90, fees and dues, etc.; \$922.25, interest; \$42.50, exhibit and drayage and handling; \$10,682.15, total, which amount, less collection fees, postage, remittances and dues received in connection with trade papers, \$124, left a balance \$11,522.90, which was remitted to your treasurer. For the same term vouchers issued on the treasury were as follows:

Investment	2,025 00
Expenses	11,678.85

Total	\$13,703.85
-------------	-------------

Following is a statement of amounts charged to sundry expense accounts:

Profit and loss in adjustment of accounts	\$ 17 75
Trade paper subscriptions	218 58
Investments	\$ 2,025.00
Corporation and attorney fees,	40 00
Drayage and handling	1,135 57
Bonds of secretary and treasurer	38 00
Freight and expressage	131 04
Directors' expenses, board meetings, convention week	1,038 56
Traveling expenses, secretary, space sales local clubs	625 71
Office supplies including sub. to Commercial Agency..	88 55
Postage	1,062 00
Printing and stationery	846 08
Advertising in Trade Press	1,080 50
Badges	59 70
Telephone and telegraph	23 32
Delegates' expenses to National Federation	92 10
Salaries of Sec'y and office help	\$2,900
Pres. and Treas. and office help	275 3,175 00
National Federation	164 00
Convention and hall expense, light, heat and rent.....	1,829 49
Ladies' entertainment	159 15

Total	\$13,850 10
-------------	-------------

\$2,000 was invested in Hawaiian 4¼ per cent gold bonds, the premium being \$25.

There never was a time when it so urgently behooves the dealers to be thoroughly organized. There has been much unfair criticism of the retailer or middleman. No class of men have started as many citizens in business and toward independence as have the retail implement dealers; neither has there ever been a greater educative force than these same men who enlighten the farmer as to the best tools and methods for cultivation, bringing to his notice machinery and implements to lighten his work and increase his profits by enlarging crops.

Corporations and business enterprises of all kinds, large and small, have been, and are, the subject of social investigation by government authorities.

As an association we have diligently pursued only a lawful and fair course. We must needs stand together, rendering to each other all encouragement and assistance that our true position in the distributive world may be realized and our necessity to the public acknowledged.

The year 1911 witnessed our first real effort in establishing local clubs in Tri-State territory, in establishing five local clubs.

From this beginning we anticipate a satisfactory spread. We are firmly convinced that with a county or neighborhood organ-

year, what we believe to be the greatest exhibit of finished vehicles, implements, automobiles and harness ever assembled under one roof.

The trade press has rendered invaluable service to our cause, placing at our disposal valuable space in its publications far beyond the possibility of financial returns to it.

P. T. RATHBUN Secretary.

TREASURER'S REPORT.

Treasurer George P. Young made his report as follows:

Receipts, 1910-11	\$15,039 64
Disbursements, 1910-11	\$13,703 85

Balance	\$1,335 79
---------------	------------

T. H. McGeorge presented a paper upon "Specialties and Our Experience in Handling," as follows:

The word "Specialties," so far as it applies to the implement business, in my opinion, covers a large field. For many years I have been searching for specialties, or something that I could add to my stock, which would yield a revenue, and not increase my expense account, and at the same time keep my labor profitably employed. Having this idea in mind, and knowing it was up to me, I have tried to turn idleness into a profit, or at least cost, and have made several failures, and some few successes.

Every implement dealer who has any sort of an organization, has certain fixed charges he can't reduce, and the sale of any line which does not increase the expense, adds just so much to his net profits. I have never been in favor of implement men going clear out of their line to add to their stock. While I recognize the fact that business belongs to any man who can get it,



L. W. KATTMAN
President Tri-State Association.

ization of retail implement and vehicle dealers, the solution of a considerable share of our perplexities and troubles is at hand. The Tri-State Association stands ready and anxious to assist our members in any locality wherein favorable conditions obtain, and has prepared a model constitution and by-laws for this purpose. A representative of this association is available to any dealer who, with the co-operation of neighbors in the same line, will undertake such a local organization.

At solicitation of the National Federation of Retail Implement and Vehicle Dealers' Association, the writer represented that body at public hearings before sub-committee of committee on post offices and post roads at Washington, D. C., in July, 1911.

One hopeful sign was the intimation that the senate committee on post offices and post roads would later hold a similar public hearing, to have full information before enacting any legislation or passing any of the proposed parcels post measures.

We believe that the strongest force behind the matter is the second class mail publishers, particularly farm papers, journals and magazines, which depend for their advertising patronage upon mail order or direct selling business. They have multiplied rapidly in number.

We commend the National Federation of Retail Implement and Vehicle Dealers' Associations, of which the Tri-State is a member, as one of the most courageous, yet conservative, effective, though not radical organizations in the interest of retailers in vehicles and implements possible. Your delegates to their late convention will have an interesting report for you on Thursday morning.

For your inspection, and approval, we have assembled this



T. H. McGEORGE
Second Vice-President, Tri-State Association.

I think he should be careful about encroaching on the other fellow's lines.

We are at this time engaged in the following business: implements, vehicles, harness, heating and plumbing. And in addition to this, we carry in stock the following goods, which we call specialties, and which are sold with additional direct or overhead cost: clover bunches, fanning mills, wire fencing, nails, barb wire, staples, grindstones, sickle grinders, storm fronts, hay carriers, track, etc., wheelbarrows, ladders, tanks and troughs, feeders, water founts, steel goods, such as hoes, rakes, shovels, etc., incubators and brooders, oil and grease, wrenches, chisels, etc., carriage and wagon paint, pumps, iron pipe and

fittings. All of which we sell without any cost for expense, except interest on the money invested in stock. All the goods in the above list are with us good sellers, and make some money, with the exception of hay carriers, incubators and brooders. We don't sell enough of these. On hay carriers, track, etc., the hardware men usually get the business by including in bill of hardware for the barn.

Another group of specialties we sell, such as gasoline engines, grain dumps, cream separators, wagon scales, fertilizer, and wind engines, which all add to our expense in a way, because we canvass for these articles. But on the whole we think they yield a good revenue and help out on our canvassing expenses.

In the past we have handled a full line of paints, but we did not find it profitable, so we cut out all except carriage and wagon paints.

We have tried the acetylene gas machine business in connection with our plumbing business but found it more of a business than a side line. While the field for gas lighting in any community is unlimited, we did not find it profitable for the reason it took too much time to sell, and interfered with our regular business.

Our heating and plumbing department has almost outlived its usefulness, as our other business has increased to such an extent we don't need the work as much as we did, and our competition in this line is fierce. While we do some small jobs, we only go after the large jobs, on which our competitors are afraid to figure.

In keeping track of our business, we have divided it into four departments.

No. 1—We class all general implements.

No. 2—All machinery such as binders, mowers, gasoline en-

We have now under consideration the adding to our stock of a line of machinery accessories, such as shafting, pulleys, belting, brass goods, steam hose, etc., as we have some demand for these goods, and believe we could build up quite a business in this line, by carrying in stock a fairly complete line of these goods, as the farmer is adding more or less machinery to his equipment.

I have had experience in garden seed and stock food lines, and found them both a complete failure. The field seed proposition I have never tried, while it is sold by a considerable number of dealers. But from the investigation I have made, I find it ties up a lot of money, and then when the seed is sold, there is very little profit. There is also danger of making customers



P. T. RATHBUN,
Secretary, Tri-State Association

sore on account of unclean seed. Prices of field seed fluctuate so much, that in my opinion it makes the sale of it too much of a speculation.

The greatly increased use of cement has opened a field for many dealers. But in my locality it is sold on too small a profit for us.

The lightning rod is a proposition which is worked by quite a number of implement men with seeming success. I have had no experience in this line, but am of the opinion that it is more of a business than a specialty, as it takes a lot of talk to convince a farmer he needs rods, for having in mind the rods were formerly sold, he is very much afraid of being buncoed. While the profit in this line is large and looks good, I think if the implement man will figure his time selling and installing, he will come out loser.

The automobile proposition we have had under consideration several times, and the auto business certainly belongs to the implement dealer, as his is the only established business which is really able to take care of the auto trade. But the automobile business being different in all respects from any other business, the output of the automobile factories has not sought an outlet through the legitimate dealers, or any other particular source, but the outlet made itself. But the time is coming when it will take business men and salesmanship to sell autos, the same as anything else. And I firmly believe that when the auto agents get through playing with the business the field will be ready for us. The two things that have kept the implement men away from the auto business are the lack of profit in the business (the idea of doing \$1,000 to \$1,500 worth of business for a profit of from \$25 to \$50 doesn't look good to an implement man);



A. BRESLEN
Third Vice-President, Tri-State Association.

gines, manure spreaders, rakes, tedders, loaders, twine, cream separators, grain dumps and scales.

No. 3—Vehicles, harness, and all things pertaining to horse goods business.

No. 4—Heating and plumbing, pumps, iron pipe, and such hardware as fencing, washing machines, churns, grindstones, etc.

We find that by dividing the overhead expense on a pro-rata basis, each department shows a profit. And department No. 4, in which is thrown most of the specialties or side lines, shows the best per cent of the profit.

and the other, that the automobile was not worth the price asked for it by the factory. Every real implement man has the interests of his customer at heart same as his own. But the time is coming, and it is not far distant, when the automobile will be sold off the implement man's floor just the same as a wagon or buggy is now sold, and it will be sold at real value too. I can well remember when the buggy business was in just the same shape the auto business is now. Every cross roads livery stable had a buggy or two to sell. Every blacksmith was a buggy man. Every horse trader had a few cheap buggies to swap, and the fellows came through the country with a string of buggies a quarter of a mile long. All of the above ways of selling buggies have disappeared, and the selling of automobiles in the wild-cat way will eventually disappear and leave the field to the only legitimate dealer there is—the implement man. And I think the implement man had better be getting busy with the auto line, or at least try to figure out the class of machine which will be the seller in his particular county, as I think the motor era almost here, and it will not be long before



F. J. GEIS
Director, Tri-State Association.

the implement man will be selling motor implements of all kinds, as we now have many farm machines motor driven, and more are being brought out each year.

Joseph H. Goldcamp addressed the convention on

LOYALTY TO LOYAL MANUFACTURERS.

When we dealers enter into a contract with loyal manufacturers of vehicles, harness or implements, we have taken the obligation of selling their product in the vicinity granted us. To consider this fully we should realize that we are an employe of the loyal manufacturer. On us dealers depends the selling of their product, and the success of the manufacturers' business.

Our compensation for our work is the profit, or amount which we sell the article above the cost to us as dealers. To fulfill our obligation we must buy their product at prices that will enable us to be loyal to them, these prices must be in comparison to other manufacturers, they must be so low that we dealers are enabled to meet all kinds of competition on the same class, style and quality of goods and leave the dealer a fair compensation for his work.

To be faithful to the manufacturers we should place their line before the consumer in a manner that will sell the most goods possible. Above all, know the goods you are selling,

know how they are made, what material is used in their construction, in view that we can explain to our customers so well that they cannot be deceived in the article they are purchasing.

As our work is selling the manufacturer's product, we should not allow or ask the manufacturer to do our part of this work. We should not allow them to furnish us with salesmen to sell our goods, as it must take a portion of the compensation that rightly belongs to us dealers. The profit of to-day for the dealer is too small to have two men to do the work of one. It has been my experience that the time and expense of the extra man is wasted and that the dealer in the end pays for him in the price paid the manufacturer. If we will only take time enough to learn thoroughly the articles we have to sell we will have no use for the so-called "General Agent," who could not make good on the farm, or when engaged in business for himself, and is now being driven around by dealers to explain these articles which we have agreed to sell.

I do not feel there are any of the 60,000 dealers who would admit that they are not capable of selling an article after it has been explained to the user, if we have impressed the customer that it is the article he should buy. This also gives the farmer or customer the idea that there is considerable of a profit which he has to pay on the goods sold to him and to sell the goods in this manner there must be a considerable profit to some one. However, the speaker believes if careful attention is given to the regular salesman from whom he buys his goods and the catalog, the expense of the so-called "General Agent" can be eliminated.

We dealers too often do not take the time to learn the goods we are selling, or if we do know them ourselves, we fail to have them explained to our helpers. In this way we lose sales that rightly belong to us and the manufacturer whom we represent.

We should be prompt in our settlements with the manufacturer. I find the greatest trouble is, we have been unconsciously tramped on by the manufacturers extending too long payments to the farmer mostly through the commission contracts and the extra canvasser.

To change to shorter terms to our customers is not easy, but we must do it. Manufacturers are shortening the payments to us, we must do the same to our customers. To do this we must take full charge of the selling and do away with the manufacturer's canvasser, with a possible exception of a salesman whose business it is to keep us and our salesman posted on the new machines, plows or any articles, whatever they may be.

We must buy their goods outright, sell to all customers at exactly the same price and terms, get a settlement for the goods as soon as they go out, and refuse to sell goods on commission.

We should see that the repairs are ordered promptly and encourage the manufacturer to keep them at a reasonable distance from us, and as soon as the repairs are received, see that customer is notified at once.

We should take care not to let the customer unreasonably impose on us in furnishing gratis repairs, when we do, we should not ask the manufacturer to replace them free of charge to us, which is too often done by the dealers.

It is time we are getting our eyes open to the importance of buying goods from loyal manufacturers. Every time a dealer buys from a factory owned or controlled by a catalog house or manufacturer, that is, selling any part of their output to the catalogue house, he not only helps to build up the catalogue house business, but is paving the way for increased competition from that source. The greatest danger that I see in buying any part of our goods from manufacturers that are not loyal is, that it demonstrates to the loyal manufacturer the possibility of him selling goods to both dealer and consumer. If one manufacturer can do it, why not he?

I have found that it always pays to sell goods made by well established manufacturers, with a reputation for building first class goods.

We often take on too many different lines to sell. This places

us in a position wherein we cannot possibly do justice to all of them; we too easily forget that we have one contract, we listen to and do what we are asked to do by the manufacturer's salesman who is present, and neglect our first obligation to our manufacturer who has been loyal to us, whose goods have been satisfactory to our customer and ourselves.

A dealer often enters into a contract with the manufacturer to keep a competitor from having the line, knowing at the time that he will not sell any or but a few of the goods; others buy one piece of machinery same as competitor carries in stock regularly, for no other reason than to be used as a "stool pigeon." The dealers that do these things are not loyal to the manufacturer, their competitors or themselves.

It is very essential to the manufacturers that they have loyal dealers, but it is just as essential that the dealers have manufacturers that are loyal to them.

A manufacturer is either with the dealers or against them. If he sells one of their products direct or to a catalog house and the remainder of his goods to jobbers and dealers, he is not a loyal manufacturer, and he is against the dealer.

There are other manufacturers that want to be classed as loyal manufacturers, who, when they find they are unable to interest regular dealers who have contracted for similar goods, will place their product with blacksmiths, liverymen, farmers, "curbstone brokers," or worse, place their product in a retail establishment under their own management, all the while increasing undesirable competition for the legitimate dealer.

There are a great many objectionable features in the relations of the dealer to the manufacturer that can be overcome by the manufacturers giving their loyalty to the dealer.

We dealers would make it much more pleasant and profitable by showing our loyalty to loyal manufacturers.

OPEN SESSION.

An open session of the convention was held at the room of the Cincinnati Business Men's Club Wednesday evening. The fore part of the evening was occupied by a paper by W. C. McMaken, of Ft. Wayne, Ind., on

"The Local Club and What It Is Doing in Our Territory."

A little history will not come amiss here. On February 27, 1911, fourteen dealers, from the territory comprising Allen, Whitley, Huntington, Wabash and Kosciusco counties, met at the Randall Hotel at Fort Wayne for the purpose of discussing trade conditions in the territory represented, and to decide what, if anything, could be done to improve conditions. Mr. Rathbun, secretary of the Tri-State Association, was present and advanced the idea of the local club, pointing out its advantages to the dealers and explaining in detail the method of organization. After some discussion it was decided to organize a club covering the territory in the above named counties, and same was done. It was decided that we should meet every month at different places in the territory.

You might ask, does the fact that so few dealers attended meetings indicate that they lost interest in the local club proposition? I answer, no. It was simply a case of each one thinking that the other fellow would be there and attend to what-ever came up.

At our first meeting we merely outlined some of the things we would like to accomplish. The principal item of discussion was cost accounting. Mr. Rathbun gave a very interesting and instructive talk on cost accounting, with the aid of the blackboard. At our next meeting, held at Fort Wayne, several of the members gave talks on this subject and we were gratified to see that the interest was increasing rapidly. What has been the result? Naturally the first thing to ascertain is whether the discussion of this subject by the dealers present has in any way resulted in a decrease of the evils of price cutting. Opinions differ among our members, but for one, I am free to say that while conditions are not yet ideal in our territory, I could see that in the beginning of the season, at least, there was an effort made to secure better prices. One thing at least that is worth

all the effort that has been expended is the increased friendliness that has been brought about by the dealers getting together in the club meeting and talking over the problems that arise in the conduct of our business, and this is the entering wedge to a feeling of confidence among them that will, in the end, I am sure, make for the betterment of the business.

As to the amount of territory covered by our club, I believe that it is too large to get all the dealers together as often and as closely as the idea of a local club would demand. We have almost one hundred dealers in the territory covered that would be eligible for membership.

I believe that we should, as soon as possible, organize the dealers in each county covered by our club, meeting at least once a month. The dealers in each county are up against the same propositions, and can better get together and work out their problems than the dealers of five counties. Then I believe that the local club, comprising the five counties, should meet at least once every three months, receiving reports from the county clubs, and in this way bringing all the dealers together



JOSEPH H. GOLDCAMP
Director, Tri-State Association

occasionally and strengthening both the county and club organizations. Personal work in each county represented will accomplish the desired result of bringing every dealer in the territory into membership in the local club, and through that means into the Tri-State association.

Cost accounting, in my opinion, should be the keynote of the organization, until such time as every dealer shall have become thoroughly familiar with its principles, and shall have adopted them in the conduct of his business.

There is no reason why dealers in our line of business should not be just as closely allied for the promotion and protection of their interests as the hardware dealers, or any other line. I do not mean to say that we should attempt to regulate prices, or control competition in any, but I do believe that the confidence engendered by frequent meetings of competing dealers, and the knowledge that all are using the same method of computing selling prices, using the actual cost of doing business as a basis, will in time bring about an adjustment of prices on the part of each dealer that will make the business of retailing implements and vehicles much more satisfactory and profitable than it is at the present time.

Another important matter than can be taken up by the local club is the credit bureau. In one county alone this cannot be

done so well, as there are many people along the border lines of adjoining counties who cross the lines to trade. By covering several adjoining counties a very efficient credit bureau could be established and maintained by each dealer informing the secretary of bad risks that come under his observation, removals from one territory to another, etc. There are many people who make a practice of going from one store to another to purchase their supplies, leaving a trail of bad debts behind them. This could be eliminated to a large extent were the dealers interested to keep one another informed of the status of these parties, through the medium of a credit bureau.

Then again, often a dealer will discover that another dealer is buying cheaper than he is. That a certain firm is discriminating in the other fellow's favor. Perhaps one dealer has devised some new scheme of improving poor collections, obtaining prompter settlements, decreasing certain lines, etc. Get together and talk over the business. You will always find the other fellow's ideas helpful to you, even though you do not find it expedient to adopt them in the conduct of your own business. I am sure that you will find yourselves well repaid for the time it takes. We have too long been clams afraid to come out of our shells for fear the other fellow would get something on us. We must get away from that idea and co-operate with one another or else we will never get our business where we all say we want it. We must do more than talk about what we want, and what we will do. We must do it. "Do It Now" is a good motto, and one which we can well adopt for ourselves. We are inclined to lay the blame for many of the trade evils that now exist on the manufacturer. Are we not also to blame in some extent for allowing them to do these things that we are now objecting to? Our business is in our own hands. By co-operating we can weed out the evils that we are responsible for, and also by means of just such conferences as this to-night, get closer together with the people from whom we buy our goods satisfactorily to all.

If all the territory in the Tri-State Association was well organized into active local clubs, with every dealer an enthusiastic member, the problem of securing a good attendance at our conventions would resolve itself into a problem of finding a place large enough to take care of all the dealers that would insist on coming.

In conclusion let me say, while it is a task of great magnitude and will take considerable time, not until all our dealers are working together with might and main and getting together often in a friendly and helpful discussion of their mutual problems, then and not until then, will the day ever come when the implement and vehicle dealers as a class will take the place of rightfully belonging to them, that of one of the principal cogs in the great wheel that grinds out the food that we all subsist on, and the value of which cog could only be adequately determined by the elimination for a short time of all retail dealers. You all know what that would mean, not only to the manufacturers, but to the farmer who looks to the dealer for service in connection with the operation and care of his machinery. We have a work to do. It is a legitimate and honorable work, should be a source of continued satisfaction and pleasure to those engaged in it, and certainly should furnish sufficient remuneration to enable the dealer to establish and continue his business on a firm and safe foundation.

Following the presentation of this paper Mr. Rathbun asked for the floor, and said:

I am certainly not going to burden you with any long talk; but I cannot let this opportunity escape to say a word about the local club in which we are all so much interested, particularly by reason of the fact that we see a few dealers here who are not members of the association and who do not keep in touch with our convention work. If there is any dealer here from the Tri-State territory who is having trouble due to unprofitable conditions, or any matters that co-operation can eradicate, if you will notify the Tri-State Association, we stand

ready to send a man into your territory to help you organize a local club. If you will just get together and become acquainted wherever there are local dealers you will find in the course of a few months very greatly improved conditions in your territory.

The remainder of the evening was occupied with a Dutch lunch and smoker.

CONCLUDING SESSION.

Immediately upon reconvening on Thursday morning the convention took up the matter of the reports of committees, on auditing, resolutions, congratulations, appreciation, parcel post, cost accounting, freight and express rates, direct sales to consumers, local organization, canvassers and honest advertising.

ELECTION OF OFFICERS.

L. W. Kattman, New Knoxville, O., was elected president by acclamation.

Following reports of the various state delegations the remainder of the official board was elected as follows:

First vice-president, Chas. Otterbacher, Wellington, O.; second vice-president, T. H. McGeorge, Covington, Ind.; third vice-president, A. Bresler, Owensboro, Ky.; directors, Jos. H. Goldcamp, Lancaster, O.; H. A. Lowrey, Litchfield, Ky.; F. J. Geis, Brookville, Ind.

The following persons were elected delegates and alternates to the next meeting of the National Federation of Retail Implement and Vehicle Dealers' Associations; C. H. Little, Barnesville, O.; alternate, Chas. Otterbacher, Wellington, O.; W. G. McMaken, Ft. Wayne, Ind.; T. J. Turley, Owensboro, Ky.; alternate, J. L. Watkins, Lexington, Ky.

On motion by Mr. Neutzel, the secretary was instructed to write a letter expressing the thanks of the association to the membership committee, to the ladies of the entertainment committee and to the press for services rendered during the convention.

C. M. Johnson, Rush City, Minn., then addressed the convention in a few words telling of association effort.

Upon motion the convention then adjourned to meet at call of the directors.

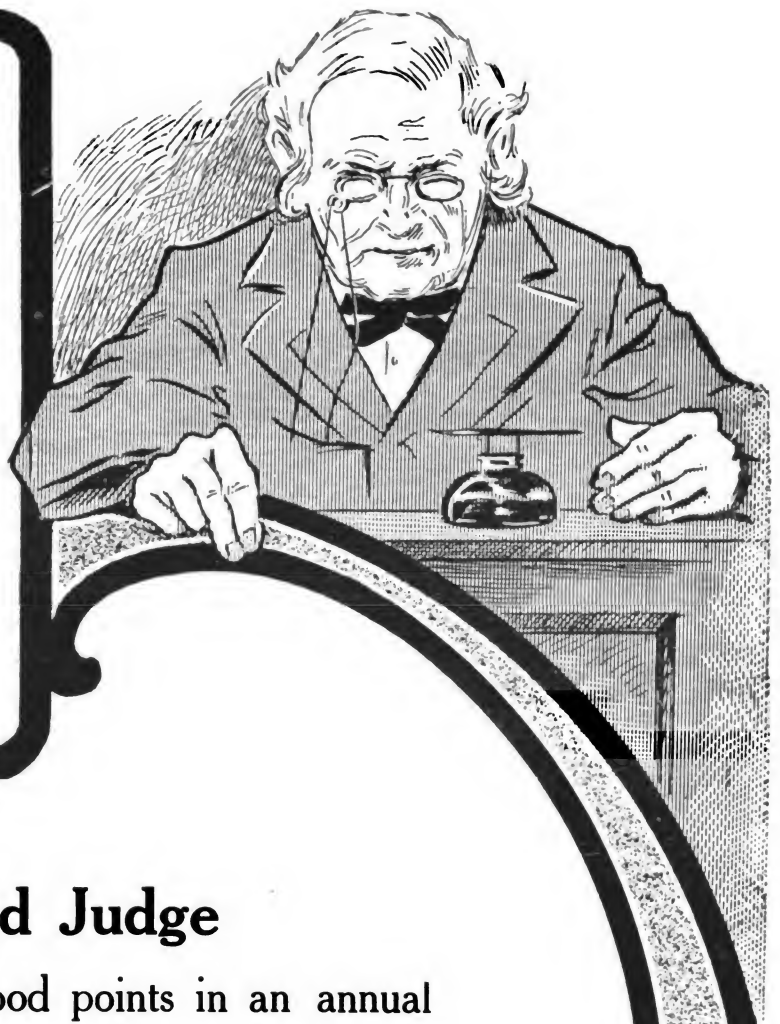
BLUEPRINTING.

To test a print in the frame, blow the breath on the corner of the border line. If the line perceptibly darkens the print is done. Simple washing in water will make a good print if the paper is not aged. Ordinary commercial blueprint paper for sunlight exposure will keep from four to six weeks in a metal tube before commencing to deteriorate. However, if the paper is aged, or the print slightly overexposed, the lines will appear pale blue and the background fairly dark after washing. To make a good print with such paper, add enough of a previously prepared saturated solution of potassium bichromate to make the bath a pale amber color. The effect of adding the solution is to intensify the background and bleach the lines, making a sharp contrasty print. It is not a bad plan to subject every print to a slight overexposure and use the bichromate solution habitually. For a pale print practically nothing can be done except to wash quickly, about half a minute, as the water bath has a bleaching effect. Drying in a darkened room will prevent further bleaching.—American Machinist.

NEW YORK BRANCH.

Phineas Jones & Co., the well known wheel makers of Newark, N. J., have opened a branch factory at 12th avenue and 55th street, New York. They have installed the latest and best wheel machinery. A specialty will be repair work on auto truck vehicle wheels. They will endeavor to do their work quickly and at reasonable prices. As auto truck users do not like to remain long without the use of their trucks we commend them to this well known house.

The Trade
Passes Judgment
on
The Hub Style Portfolio
of September, 1911



A Good Judge

Can recognize the good points in an annual album of styles representing the popular designs in vehicles, the latest models in automobiles and the advance offerings in motor wagons.

Read the decisions that follow

Watch for the 1912
Style Portfolio
(September)

CURLEY N.Y.

Splendid Appearance.



Indianapolis, Ind., U.S.A.

The Hub,
#24 Murray St.,
New York, N. Y.

Gentlemen:

We have received the September copy of the Hub containing your Style Portfolio and wish to compliment you on the splendid appearance of the book. You have certainly given yourselves a splendid commendation to the carriage trade by showing such a complete line of 1912 models this early in the season.

Very truly yours,

PARRY MFG. COMPANY,

BY

Adv. Manager

BWD-76

Effective.

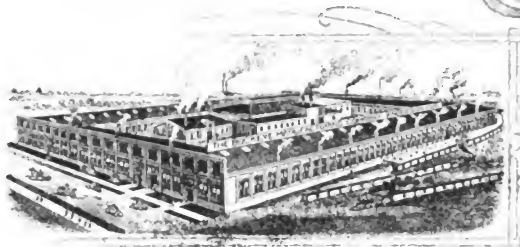
ALL CONTRACTS CONTINGENT UPON FIRES, STRIKES AND ALL OTHER CAUSES BEYOND OUR CONTROL AND SUBJECT TO THE APPROVAL OF AN OFFICER OF THIS COMPANY

B.F. LAMBERT, President

G.A. LAMBERT, Vice Pres & Sec

J.W. LAMBERT, Treas & Genl Mgr

BELL PHONE EXCHANGE 255.
D. & M. PHONE 255



MEMBERS ASSOCIATION OF LICENSED AUTOMOBILE MANUFACTURERS.
MEMBER WHEELER "ELDEN PATH"



Anderson, Ind. U.S.A.
Sept. 30, 1911.

THE HUB,
New York City.

Gentlemen:

We congratulate you upon that issue of THE HUB which included a number of styles of both buggies and automobiles.

We believe that you have grouped the entire proposition in a very logical manner, so as to make it convenient for the man who is interested in such a proposition. We presume that general appearances are what you are most interested in giving the reader by this method, and we know of none other that would be especially more effective in this line.

Yours very truly,

BUCKEYE MANUFACTURING CO.

By

Assistant Sales Mgr.

ARL/FS

An Annual Feature.

"THE STANDARD FOR QUALITY"

NEW YORK

CHICAGO

BOSTON

PARIS

CHARLES S. HOMER, Chairman

NATHAN T. PULSIFER, President.
ALLAN A. MORRILL, Vice PresidentJ. ANGON B. VALENTINE, 2nd Vice Pres.
A. LAWRENCE PHILLIPS, Secy & Treas.Cable Address:
Copal, New York.Factories:
New York & Chicago.

257 Broadway, New York.

Editor THE HUB,

New York City

Dear Sir:-

You will see how much we appreciate your Style Portfolio, from the fact that we are taking it as the basis for all our advertising in the current trade papers.

We were especially gratified in looking over the fine list of contributors to the Portfolio, to find that eighty percent of these people are users of Valentine & Company's materials, and it seemed to us that, considering the representative character of the list, and our big percentage in it, there could be no better way to use an advertising page than to tell the facts.

Why don't you make this Style Portfolio an annual feature of THE HUB? It should be a very popular one.

Yours truly,

VALENTINE & COMPANY.

Preserve for Reference.

FRANKLIN AUTOMOBILE COMPANY

SYRACUSE, N.Y. U.S.A.

DISTRIBUTORS OF


REGISTERED U.S. PAT. OFFICE
MOTOR CARS

September 29, 1911.

The Hub.

24-26 Murray Street, New York City.

Gentlemen:

We have received the September style Portfolio number of The Hub with illustrations of horse-drawn electric and gasoline vehicles, both pleasure and commercial, and in reply to your question as to whether the idea is worth while will say that we believe it is.

An automobile or carriage exhibition is admirable for displaying a collection of vehicles but the exhibition lasts but a short time whereas your Portfolio number is something which every interested person will preserve for reference.

Yours truly,

LMK
RWS
GHB

FRANKLIN AUTOMOBILE COMPANY

Per *G H Bryant*

Well Made.

FRED. POSTAL, Vice President
L.B. ROBERTSON, Secretary

H. BOWEN, President and Mgr.

AUSTIN E. MOREY, Treasurer.
W. H. SHIERSON, Asst. Treasurer.



LION MOTOR CAR CO.,
MANUFACTURERS
ADRIAN, MICH.

" The Hub ",
24 Murray St.,
New York City.

Gentlemen:-

The September Style Portfolio number of the Hub, which contained the excellent illustrations of so vast a number of different makes of automobiles, was not only very well made but was excellently printed. The number was also very interesting.

We appreciate the copy you sent us and wish to advise that it is filed with the balance of our reference books.

Very truly yours,
LION MOTOR CAR COMPANY.

W. H. Shierson
Advertising Manager.

JAT-D

Keep the Good Work Up.



THE ONLY MANUFACTURERS OF
SPECIAL CARRIAGE TRIMMERS PASTE
Guaranteed Vermin Proof. Will Keep in Any Climate

BUCKEYE PASTE CO

MANUFACTURERS OF

LIQUID
and DRY Paste

67-89 N. Third St.

oooooooooooooooooooo	
No. 10.	Paper Hangers' Paste
" 12.	Bindery Paste
" 20.	Box Makers' Paste
" 24.	Label Paste
" 30.	Trunk Makers' Paste
" 34.	Carriage Trimmers' Paste
" 38.	Carriage Trimmers' Special Vermin Proof
" 40.	Brewers' Special Label Paste
" 42.	Brewers' Stamp Paste
" 44.	Buckeye Library Paste
" 46.	Buckeye Mucilage.
oooooooooooooooooooo	

Columbus, O., Oct. 11, 1911.

The Hub,
New York City,

Gentlemen:

It is a pleasure for us to say that in going over the September Style Portfolio number of The Hub, we found it brim full of good things in every department from cover to cover. Keep the good work up.

Relative to the classified index, we have no suggestions to offer except that we might be classified as; Paste. (Trimmers)

Thanking you very kindly for the write-up in addition to our advertisement and which we trust will wake a few of them up to pay for your kind efforts to give us more publicity, we are,

Yours very truly,

THE BUCKEYE PASTE CO.

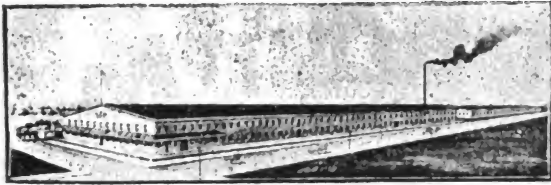
J. R. Hartman MGR.

H/2

Benefit to Manufacturers.

A. H. Havenkotte

J. S. Upson



South Georgia Buggy Co.

WHOLESALE MANUFACTURERS

High Grade Buggies and Surries

VALDOSTA, GA.,

THE HUB,

24-26 Murray St.,

New York, N. Y.

Gentlemen:-

We have received the September Style Portfolio number of THE HUB and wish to congratulate you upon the excellence of this number.

The manufacturers whose illustrations appeared in this number are greatly indebted to you. This number will be of much benefit to the manufacturers.

Yours truly,

South Georgia Buggy Co.

KGT.

Does Great Credit.

The Fairfield Rubber Co.
Manufacturers of
Carriage Cloth, Imitation Leather, etc.

E. W. HARRAL, PRES.
A. C. WHEELER, TREAS.
F. M. GOODELL, SECY.

Fairfield, Conn. October 4th

REPLY TO YOURS OF

The Hub.,
New York.

Gentlemen :-

We wish to congratulate you on the September issue of the Hub, which does you great credit. It is a pleasure to pat those on the back that deserve it, consequently we hasten to give you a good one.

Regards and best wishes from,

Yours very truly,

The Fairfield Rubber Co.,

Very Attractive.



C. W. MANSUR, SECY AND MANAGER
ADDRESS ALL COMMUNICATIONS TO THE COMPANY
CABLE ADDRESS "DEERE"
CODES USED, A. B. C., 4TH AND 5TH EDITIONS AND WESTERN UNION.

THE JOHN DEERE PLOW CO.
OF ST. LOUIS.
FARM MACHINERY AND VEHICLES
ST. LOUIS AND NEW ORLEANS



ST. LOUIS OFFICES 2204 - 2220 N. BROADWAY.

DICTATED BY

A.T.S. ST. LOUIS Oct. 18, 1911.

Trade News Pub. Co.,
24-26 Murray St.,
New York.

Gentlemen:

Please excuse our delay in acknowledging receipt of your recent issue of the Hub, containing several hundred illustrations of the leading styles of buggies, etc. built in this country.

The issue was certainly a very attractive one and we are much pleased with the way our cuts appeared.

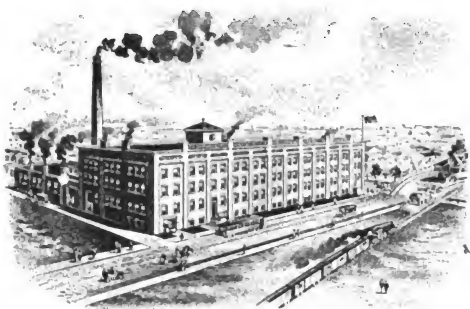
This enterprise on your part is surely appreciated by your subscribers as well as by the manufacturers who participated in the demonstration.

Very truly yours,

THE JOHN DEERE PLOW CO

A. T. Stevens
TREASURER

For the Dealer.



WOOSTER O.

Sept. 3p, 1911

The Hub,

New York City.

Gentlemen:-

We have yours of the 28th, and have also received the Journal in which you have shown the illustrations sent you and the different styles of the different manufacturers and ask us to give you our opinion as to the merits of this to the manufacturer and we think it is a very good idea and one of the best that has ever been run in a Journal, not only for the manufacturer but also for the dealer as it seems to us that the dealer would be interested in taking this journal as you know he oft times wants a certain style job and can not find it, but with all the styles that you show the dealer can certainly pick out something that will suit him so that it is profitable for the dealer and manufacturer and for the dealer especially in the Fall months when the new Styles are coming out.

Wishing you success, we are,

Yours respectfully,

The Gerstenslager Company.

Very Pretty.

G. H. BABCOCK, PRESIDENT
W. R. TASSEY, SECRETARY

W. J. MILLS, VICE PRESIDENT & TREAS.
C. M. HAUCK, PURCHASING AGENT.

H. H. Babcock Company

ESTABLISHED 1845

CARRIAGE AND AUTOMOBILE BUILDERS

BRANCH
BALTIMORE, MD.
CABLE ADDRESS: BAB
LIEBERS STANDARD
A. B. C. 4TH ED.
WESTERN UNION

MEMBERS OF
THE NATIONAL ASSOCIATION
OF MANUFACTURERS
ALSO
CARRIAGE BUILDERS
NATIONAL ASSOCIATION

Watertown, N.Y. Oct. 5/11.

The Trade News Publishing Co.,

#24 Murray St.,

N. Y. City.

Gentlemen:-

The September Style Portfolio number is a very pretty number indeed and should be very interesting to carriage and automobile dealers. Of course we hope it will be of some benefit to the advertisers.

In the classified index, we see you have our proper number, and this would be perfectly satisfactory in every way for your Quarterly Buyers' Guide.

Yours truly,

H. H. BABCOCK COMPANY.

GHB-ES

Once a Year.



HONEST WORK ATTRACTIVE STYLES MODERATE PRICES

La Porte
WHOLESALE MANUFACTURERS
Carriage Company.
FINE VEHICLES.

Sept. 30, 1911

"THE HUB"

New York, N.Y.

Gentlemen:-

We have your letter and have also received your very handsome issue for September. We certainly think this is nicely gotten up and should be a help to the trade in selecting different styles. We think your plan to issue this book once a year is a good one.

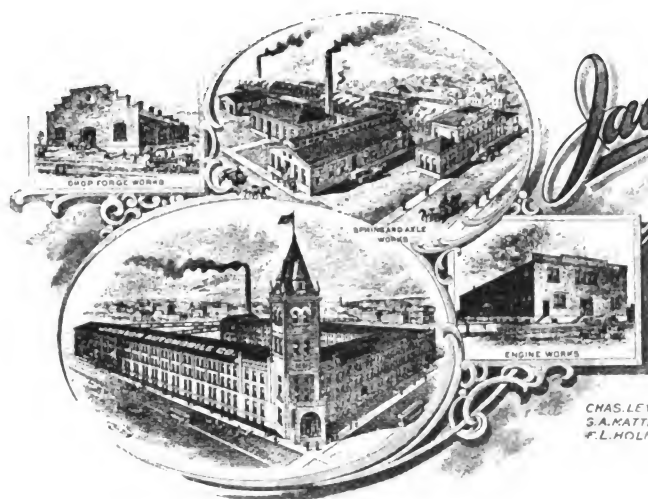
Yours very truly,

LA PORTE CARRIAGE CO.

JP-HJ.

Jay Parkhurst

One of the Strongest.



Jackson

AUTOMOBILE COMPANY

Incorporated 1902

MAKERS OF

High Grade Motor Vehicles

Jackson, Michigan, U.S.A.

CHAS. LEWIS, President.
S.A. MATTHEWS, Secy-Treas.
F.L. HOLMES, Manager.

October
Ninth
1911



The Hub,
24 Murray St.,
New York City.

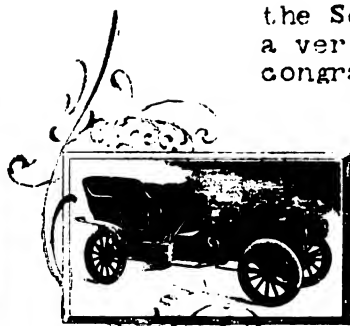
Gentlemen:-

We beg to acknowledge the receipt of the September Style Number. This is certainly a very valuable edition, and we beg to congratulate you on its appearance.

Yours very truly,

JACKSON AUTOMOBILE COMPANY.

W. H. Calhoun
Adv. Manager.



AWM-R



Gaylord Motor Car Co.

Automobile Manufacturers

Gaylord, Michigan

Pioneer
Manufacturers of
Utility Cars

Oct. 10, 1911

THE HUB
24-26 MURRAY ST.
NEW YORK, N.Y.

Gentlemen:-

We were very much pleased with your Sept. STYLE NUMBER.

It is our opinion that this sort of work by the trade papers is one of the strongest things they can do to help the industry, and we congratulate you on the fine appearance of this Number.

Very truly yours,
GAYLORD MOTOR CAR CO.

Affords Comparison.

J. ELWOOD COX, Pres.

A. M. BRIGGS, Vice Pres. & Supr.

H. A. WHITE, Secy. & Treas.



THE HIGH POINT BUGGY CO.

WHOLESALE MANUFACTURERS.

High Point, N. C. 10/3/11

The Hub,
24 Murray St.,
New York, N.Y.

Gentlemen:-

I have looked over your September edition of The Hub and find it very interesting indeed. Your pictorial method of showing vehicles of different manufacture that are practically alike is a good one for it affords comparison at a glance

Very truly yours,
HIGH POINT BUGGY CO.

SEC'Y.



The Cleveland Hardware Company.

Cleveland, Ohio

Oct. 6, 1911

Trade News Publishing Co.
24-26 Murray St.
New York, N.Y.

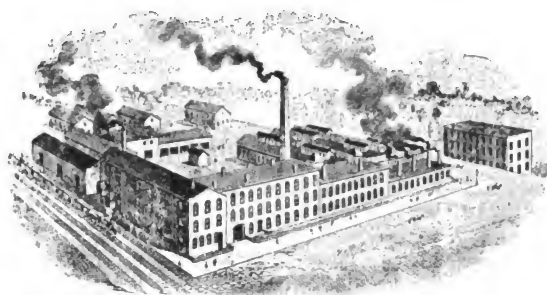
Gentlemen:-

In reply to your favor of the 2nd inst, wish to say that we approve fully of the September Portfolio number of THE HUB, and desire to compliment you on the appearance and completeness of the issue.

Very truly yours,
THE CLEVELAND HARDWARE CO.

WLM/MD.

Very Creditable.



Atum, P.D.

Oct. 4 11.

The Hub.

New York City.

Gentlemen:-

We think you have succeeded in getting out a very creditable number in the September style portfolio number. We have looked over all the cuts with much interest, and were well pleased with the whole effect.

Yours truly,

RICHARD ECCLES CO.

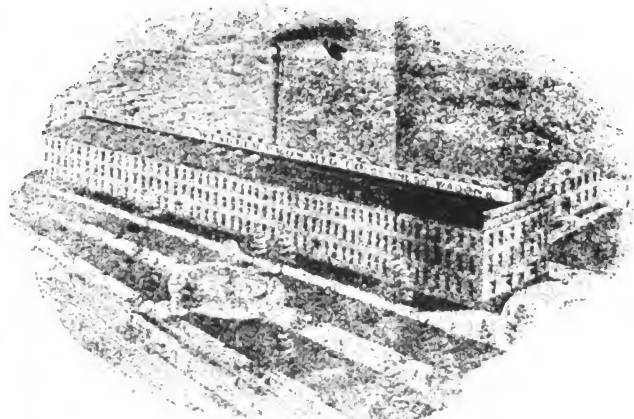
By *W. W. Eccles*

C. H. WINKLER
PRES.

WM. KNOBLOCK
VICE-PRES.

E. J. WINKLER
TREAS.

JOHN C. GRIMM
SECY.



WINKLER BROS. MFG. CO.

MANUFACTURERS OF A FULL LINE OF

**HIGH GRADE
DELIVERY WAGONS**

South Bend, Ind.,

Oct. 9, 1911

Trade News Publishing Co.,

New York, N.Y.

Gentlemen:-

We are very much pleased with the September number of THE HUB which includes several cuts of our wagons, and for which we in turn wish to thank you for the courtesy extended.

Yours truly,

WINKLER BROS MFG. CO.

A Mechanical Triumph.



FACTORIES CLEVELAND, CHICAGO, NEWARK, MONTREAL, LONDON, ENG.
SALES OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

ADVERTISING DEPARTMENT

L. R. GREENE, MANAGER

601 CANAL ROAD, N. W., CLEVELAND, O.

10-4-11

The Trade News Publishing Co.
26 Murray St.,
New York City.

Gentlemen:-

We think your special Style Portfolio of the "hub" does you a great deal of credit as the portfolio is in every way a mechanical triumph. We hope it created for you the results you deserve.

Yours very truly,

THE SHERWIN-WILLIAMS CO.

RWW-G.

Advertising Manager.

The Studebaker Corporation

SOUTH BEND, INDIANA, U. S. A.

PLEASE ADDRESS ALL CORRESPONDENCE
TO THE DEPARTMENT.

10/12/11

The Hub.

24-26 Murray St.,

New York City, N.Y.

Gentlemen:-

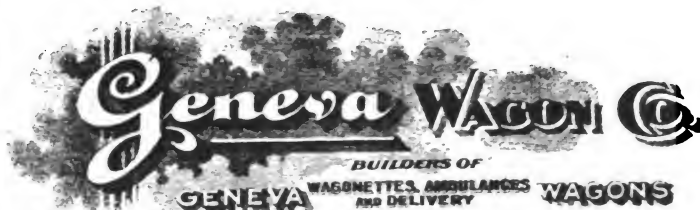
Consider your September
Style edition a very credible one, and one that dealers
will be glad to preserve for future reference.

Yours very truly,

THE STUDEBAKER CORPORATION.

Sales Department.

You Are to be Congratulated.



M. F. BLAINE, Pres. & Treas.
C. G. BLAINE, Vice President.
R. M. JOHNSON, Secy & Mgr.
A. E. EVERETT, Asst. Treasurer

Geneva, N.Y.

Sept. 29, 1911

The Hub,

New York, N.Y.

Gentlemen:-

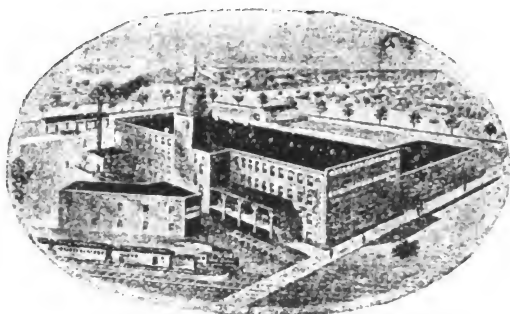
Replying to yours of yesterday would say that we received the September "Hub" and think you are to be congratulated upon this issue.

Wishing you success in your publication, we are,

Yours very truly,

GENEVA WAGON CO.

Per. *R. M. Johnson*



CORNER PENN. RY., LAUREL AND ROSS STREETS

Ahlbrand Carriage Company

A. H. AHLBRAND
W. G. AHLBRAND



O. L. AHLBRAND
E. W. AHLBRAND

WHOLESALE MANUFACTURERS OF
FINE PLEASURE VEHICLES

PHONE 162

Seymour, Ind., 9/29/11

The Hub,

New York City, N.Y.

Gentlemen:-

Your September issue of the Hub just received. Publishing these illustrations and grouping them by styles, is certainly a novel idea and should be appreciated by the dealers in general as it makes them a very convenient reference book.

Thanking you very much indeed for your courtesy in showing our styles, we beg to remain,

Yours very truly

Ahlbrand Carriage Co.



Chance to Compare.

HERCULES BUGGY COMPANY

CAPITAL STOCK \$1,000,000.00

W. H. McCURDY, President
J. D. CRAFT, Vice Pres. & Supt.
F. M. HILLS, Secy - Treas.

EVANSVILLE, IND.

The Hub,
24-26 Murray St.
New York City.

Gentlemen:-

We have your letter of the 28th, and have looked over very carefully the September Style Portfolio number. This is a very handsome edition, well arranged, and should be of great benefit to all manufacturers; it gives them a chance to compare their styles with those of other factories. It should also be valuable to the dealer.

We appreciate very much the space allotted to us.

Yours very truly,

Sec'y & Treas.



330 WEST SPRING ST.
DIRECTLY WEST OF OHIO STATE PENITENTIARY

RODERICK H. WILLCOX.

VICTOR G. BEEBE.

PETERS BUGGY CO.

MANUFACTURERS FOR THE TRADE ONLY

**BUGGIES, SURREYS, PHAETONS
AND RUNABOUTS**

COLUMBUS, OHIO.

Sept. 29, 1911

Publishers, The Hub,
24-26 Murray St.,
New York, N.Y.

Dear Sirs:-

Referring to your favor September 28th., we are in receipt of the special number of the Hub and responding to your inquiry are pleased to say that we consider the book creditable to you and believe a special number of this kind at intervals is commendable and would be received with interest by the trade.

Yours very truly,
PETERS BUGGY CO.

Album of Styles.

A. B. C. Code "W" Edition!

Calvin W. Shipley, President.
Julius C. St. Walter, Treasurer.
John C. Endebrock, Secretary.
Jacob Knapp, Vice-Pres't & Sup't.

Sechler & Company
Incorporated March 29th 1879.
Carriage Builders.
538-544 East Fifth St.

Cincinnati, O. U. S. A.



9-30-11

The Hub,
New York.

Gentlemen:-

We have your special edition of the Hub, which after looking through, we certainly regard as possessing merit, as an album of styles an on account of the ideas it suggests as to designs. This edition certainly conveys a rather expansive idea as to the styles which are being furnished in the carriage and auto trade.

Very truly,
The Sechler & Company.

J. C. Endebrock
Secretary

"WE FOOL THE WEATHER"

The Storm Queen Buggy Co.

THE MOST UP-TO-DATE STORM TOP ON THE MARKET



Mabash, Ind., 9/30/11 191

Trade News Publishing Co.,
New York, N. Y.

Dear Sirs:

We are in receipt of the Sept. Style Portfolio number of The Hub and we consider this issue a most worthy reference album of styles for the manufacturer and trade. We would heartily of an issue of this kind annually.

Yours very respectfully,
STORM QUEEN BUGGY CO.
per W M

The "Pioneer Freighter"

An Ocean to Ocean Trip with a Motor Truck.

[The photographs well depict some of the many trying situations described in the account of this trip.]

When a Saurer 4½-ton truck taken from stock, and already run 3,500 miles, made the Ocean-to-Ocean trip across the United States, carrying a 7,000-pound load nearly 5,200 miles of all kinds of highways, it accomplished what had been declared impossible. Yet it finished in perfect working condition, with a clean record of engine performance and minimum outlay for fuel and wear on tires.

The achievement of the Saurer in other parts of the world justified expectation of this result. Now that the Saurer is being manufactured in America, this Ocean-to-Ocean test was undertaken to confirm, under American conditions, the proof given repeatedly abroad.

In spite of ice and snow body-deep, mud and sand over the hubs of the wheels, boulder-strewn water courses doing duty as highways; freezing, thawing, and melting temperatures; hills that rose one foot in every three; rivers that washed the flooring of the chassis when the truck was driven across the fords—in spite of every hinderance that had been foreseen and many that were not, the "Pioneer Freighter," as the Ocean-to-Ocean Saurer truck was called, overcame every obstacle and pushed its way through without a minute's faltering of the mechanism, without the bending or breaking of a part, except the buckling of the leaves of the forward springs, one of which was cracked when the front wheels crashed through a culvert, and the other, when, in the dark, the truck ran into an unseen road impediment. A more exacting test of power and endurance could not have been devised.

The Saurer left Denver for the Pacific Coast at a time when the roads were very much worse than their average bad condi-

tion. The first part of the way the melting snow had run down from the mountains and turned the highways into mires or totally washed them out. In Arizona and New Mexico there were long stretches where the trail was impassable for wheels and the truck ran across the open, or picked its way through arroyos. On one occasion it took to the railroad tracks as it approached one of the larger towns, and ran on the sleepers and trestles for a considerable distance. In southern California it crossed the Mojave Desert after climbing the White Mountains of Arizona and the Sierras. Again and again, it was "jumped" out of particularly bad holes by pushing a plank under one of

the rear wheels, wrapping one end of a chain around the tire and the other around the forward end of the plank, and then throwing the gears into first speed, running the engine at full speed, and "jumping in" the clutch. Only the most perfect mechanism could stand that kind of treatment without being turned into junk.

As the purpose of the Ocean-to-Ocean trip was to test the Saurer on every variety of highway, in all conditions of climate, the truck did not double on its tracks from San Francisco, but was sent back to its starting point by train and began its jour-



ney to the Atlantic Coast from Pueblo, Colorado. The route lay through an agricultural country there and the roads were better than they had been in the thinly settled sections of the Southwest. But they were a constant test of efficient running under widely varied conditions.

The road story is pretty clearly told in the summary of the runs. The average rate of travel from Denver to San Francisco was a little more than six miles an hour; from Los Angeles to San Francisco, a little more than 10½ miles an hour; from Pueblo to Chicago, 10¾ miles an hour; and from Chicago to New York just about 11½ miles an hour.

There was no attempt to make speed for the sake of speed. The big truck simply pushed along at whatever rate was normal under the circumstances. From ten to twelve miles an hour was the average pace wherever there was any kind of going. Through southern California, where there are some fine highways, 10¾ miles an hour was easily obtained—for instance on the 46½-mile run from Bakersfield to Tulare, which was covered in three hours and a half, and that was about the speed on the sixty miles between Ypsilanti and Toledo, and on the 48 miles between Buffalo and Rochester.

That a truck built for ordinary transportation usage should be able to make such a trip at all is remarkable enough. That it should make it without injury except to the forward springs under the circumstances mentioned; that it should withstand all the pounding, jolting, wrenching and straining of such a journey without affecting in the slightest the efficiency of the mechanism; that there should have been no wear and tear apparent on the engine, and very little on the tires—this is a remarkable achievement for a motor truck.

Two things were proved by this notable performance. First,



the staunchness, dependability, efficiency, and economy of the Saurer; second, the feasibility of the Saurer trucks for country transportation.

The proof of the qualities of this truck for the most exacting commercial service was really not needed after the Saurer's ten years of service all over the world, but now the Americanized proof is here for whoever wants it. And the impetus that will be given to the development of motor truck transportation—the value of which has long been realized abroad—is not to be doubted.

The trip of the Saurer truck had a more serious purpose than some of the endurance exhibitions that have been given. It cannot be doubted that the development of power vehicles, for carrying heavy loads, and for lighter express service, as well, has been retarded in this country—which is behind Europe in this respect—

by the feeling that American highways were so inferior to the Continental roads that it would be impossible to use motor trucks economically here as has for some time been done abroad. It was with the intention of correcting this idea once and for all time that the Saurer "Pioneer Freighter" assumed the most difficult test to be made of a heavy car—that of carrying across the United States a three and a half ton load at a time of year when the conditions of travel are anything but the most favorable.

Apart from its value to the builders of commercial motor cars, however, the trip has been of no little general public service. For the United States government sent a special representative of the office of Public Roads of the Department of Agriculture to study road conditions between Denver and Los Angeles—a section of the country where the highways are of great importance to transportation because of the necessarily large areas without direct railroad connection. A. L. Westgard was selected for this work; and being not only a topographer but a motor car expert, he gathered a good deal of practical information as to the necessities of road construction for motor transportation service, and as to the important features of motor car construction for meeting road difficulties. The result of a pleasure car trip last year over some of the same highways traveled by the "Pioneer Freighter" was the beginning of

good roads work in several localities; and Mr. Westgard found in a number of places that the experience of the "Freighter" so impressed citizens that they immediately took steps to improve the avenues of cross-country communication.

It has been made evident, for one thing, by the run, that there is a field for the motor truck for transportation of both passengers and goods, and that where railways and other common carriers cannot operate profitably in sparsely settled regions power vehicles may be the means of building up the territory. Although the "Pioneer Freighter" proved that it was possible for a motor truck to carry even a heavy freight load across country—part of the way the Saurer ran through the open prairie where there was no road at all—it is evident that in the present stage of road development, at any rate, the motor truck cannot do this work over long distances with as great dispatch and economy as can the common carriers. For short distance freight hauling, however, the matter lies all the other way, for a good motor truck can cover a moderate trip, including loading and unloading, in less time than it takes a shipper to get a freight car—to say nothing of the time it takes the freight car to move. And when there is railway congestion, particularly as during the crop-moving period, this means a large saving of expense and often of loss of perishable goods.

Even a far-traveled automobilist can have little idea of the difficulties encountered by a big truck car, even though very powerful, and for its size, light, in traversing the variety of roads between the coasts. The load carried by the "Pioneer Freighter" consisted of camp equipment and timbers for shoring up bridges and making mud holes passable. The car also carried a powerful winch, operated by the regular motor, with which it hauled itself out of some of the bad spots. But with the tremendous rasping and straining involved in such progress, the mechanism and the

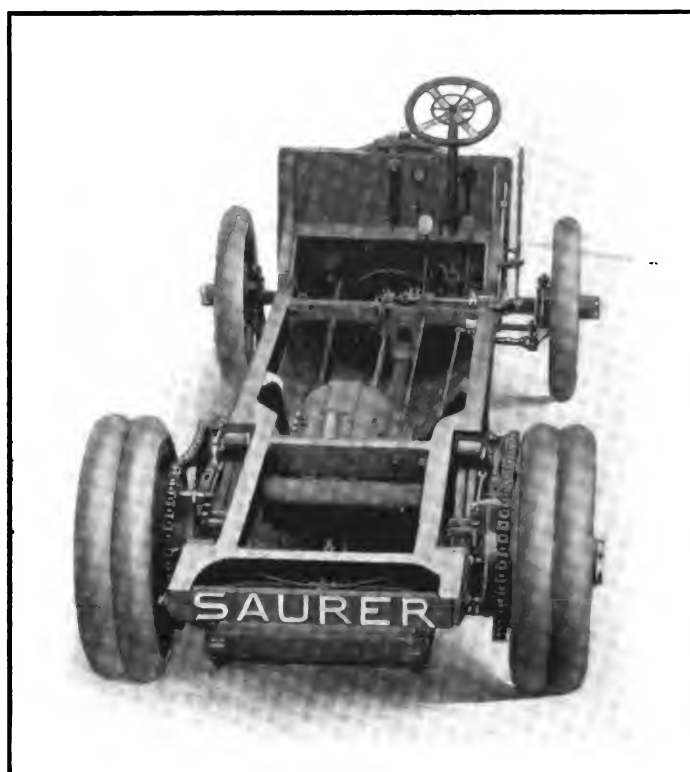


chassis structure came through unharmed except for the breaking of two leaves in a spring when the car struck an unseen obstacle in the road.

One of the interesting and remarkable details of the trip was the way in which the tires stood the test. The "Freighter" came



into New York with the original set of tiers throughout—Goodrich wireless motor truck tires, those on the rear wheels being dual. There was no tendency of the soft rubber portion of the tires to loosen and break away nor was there any shredding or grinding, though many miles of the route were over dry and boulder-covered creek bottoms, while in many places the Saurer was run for a mile or more on the sleepers of steam railways in lieu of a better road. The fine condition of these Goodrich tires at the end of the 5,000 mile journey excited much interest among tire experts, as the service to which they had been put



is admittedly as strenuous as a truck tire can be subjected to.

To the daring and "nerve" of A. C. Thompson and George McLean who "spelled" one another at the wheel of the "Pioneer Freighter" is due much of the success of the trip. These young men stuck to the big truck under trying ordeals that showed wonderful courage and endurance.

PRISON LABOR REFORM.

A Michigan commission has been investigating the conditions under which prisoners labor in various states. It recommends among other changes the following:

The abolition of contract labor in the prisons of the state.

The establishment of industries to manufacture goods on state account, while they are opposed to the use of convicts on public roads and in breaking stone.

They recommend that the board of control of each institution shall determine what industries shall be established in that institution and purchase farms for each prison sufficient to produce for the prison. The work on these farms to be done under the honor system.

That each prisoner be paid a small allowance for his earnings.

That illiterate prisoners be made to pursue a common school course while in prison.

The employment of a state parole agent to keep in touch with the paroled convicts.

It is interesting to note that while these changes are radical, the commission reports that they found the Michigan prisons to be the best in the country. The commission believes that the prisons could be made self-sustaining if the legislature would permit the boards of control to operate industries upon state account.

PRESIDENT AND ROAD CONGRESS.

President Taft has assured the success of the first annual road congress of the American Association for Highway Improvement by definitely informing the officers that he will make the opening address November 20 on the subject of the improvement and maintenance of public roads. His interest and presence meant so much to the success of the convention that in order to fit with the engagements of the President the date of the meeting was changed from the last of October to November 20 to 24.

In accepting the invitation President Taft made the statement that no single movement before the country promises such big returns on the money invested. He has repeatedly made it plain that he is heartily in favor of the good roads movement, and that he is willing to do all in his power to further it.

All the road associations in the United States and Canada which are affiliated with the American Association for Highway Improvement will take part in the convention. These now number twenty-three state and interstate organizations.

General T. Coleman du Pont, who is financing a \$2,000,000 boulevard across the State of Delaware, has accepted an invitation to be one of the speakers. Representative J. Hampton Moore, of Pennsylvania, who previously has been mainly identified with the improvement of the waterways of the country, has been elected a director of the association. He is devoting considerable of his time to the cause of improving the public roads of the country and will be one of the speakers at the convention.

Logan Waller Page, director of the government Office of Public Roads, will make an address, as will also Senator Swanson, of Virginia. Senator Martin, of Virginia, minority leader of the Senate, will likewise make an address. Other men of national prominence who have consented to address the gathering are Dr. Walter Page, editor and publisher; W. W. Finley, president of the Southern Railway; B. F. Yoakum, chairman of the Frisco lines; W. C. Brown, president of the New York Central lines; Harold Parker, chairman of the Massachusetts State Highway Commission, and most of the leading highway engineers of the country.

GREAT PERFORMANCE.

In view of the adoption of the "silent" Knight motor by the Columbia and Stearns companies, details of the test made of this type of engine by the Royal Automobile Club of Great Britain will be of interest to automobiles. The trial won for the sleeve valve motor the Dewar Trophy for the most meritorious performance of the year 1909.

The trial was supervised by six engineers appointed by the R. A. C., and lasted for ten days, at the end of which time the watchers reported monotonously regular and efficient work, despite the variety of strains imposed on the mechanism. Two motors were used, selected at random from stock going through the Daimler works at Coventry.

The engines were put on the bench for a period of 132 hours continuous running, under heavy brake load, and representing road work at sixty miles an hour, with four persons in a car. They ran out the week. At the week's end they were installed in cars and driven to Brooklands tracks, and there did five hundred miles a day for four days without stoppage or trouble of any kind.

Next the cars were driven back to Coventry, the engines taken out and given a second bench test of five hours' continuous running under load. The surprising fact was developed that at the end of this test the motors developed higher power than on the first day and established definite and positive proof that they retained full power despite the hard work imposed.

More than can be used is generally abused, of time, money or any blessing.

THE CABS OF LONDON.

Elizabeth Parker, in *The Rider and Driver*.

There are 26,000 cabs in London, and nearly all of them belong to one man, and a nobleman at that, for the premier earl of England, he of Shrewsbury and Talbot, has a vast income from the cab business of the largest city in the world. The earl gives his pet hobby as the "cab trade," and he is so fond of cabs that he frequently drives them, although he is a man of vast wealth, he seeks his fares as eagerly along the Strand and Piccadilly as any coster cabbie that ever cracked a whip.

It is impossible for any one who has visited London to think of that city without a background of hansom cabs looming up through the fog and smoke that still clings to his memory, for cabs are as much a part of the gloomy old city as Westminster Abbey or the Parliament House.

Next to bowling along on the top of a 'bus, there is nothing that the London streets has to offer quite so delightful as a spin in an easy-riding hansom. The smooth motion, the sense of freedom that the wide view before one affords, and the spice of danger ever present as the daring Jehu of the cab grazes hubs and horses with splendid skill, go to make up the keen enjoyment of a cab drive over the asphalt pavement.

The wise person picks a Shrewsbury and Talbot hansom every time, for they are strictly up-to-date—rubber tires, air cushions, Russia leather upholstery and ivory fittings. These things marked a revolution in cabs when the young earl started out to run his cab company. He was the very first person to introduce rubber tired cabs in London and Paris. The horses attached to his cabs are well groomed and clean-limbed, and the harness black, with shining brass mountings, not to mention that the Shrewsbury and Talbot cabbies are obsequious and smart in silk hats and buttonholes.

All these luxuries cost one no more than the inconveniences of a shabby cab, and as there is such an army of cabs in London why may one not take his pick of the best there are?

Aside from the enjoyment to be derived from a dash over asphalt pavements in a London hansom, few people realize what these two-wheeled chariots mean to the great city, for the London cab constitutes a mighty institution that is highly commendable for the utility and comfort it affords at a very low price.

The cab industry is in the hands of a large number of men—about 4,000—many of whom own three or four cabs, which they let out, and are known by the title of "Mushers."

The first large cab company of any note was that of the Earl of Shrewsbury and Talbot, founded in 1883, his stables at Tixall accommodating 450 horses with their grooms.

The London Imperial Cab Company, a recent enterprise, has undertaken the management of about 500 cabs of an improved pattern. The company has a large depot off Gray's Inn road, with stables, sheds, shoeing forges, harness rooms and painting and repairing shops. At Chelsea, too, it has built a model stable, three stories high, fashioned in a square about a court where the cabs stand.

Before a cab is allowed to go on the street three payments have to be made—5s. for a driver's license, £2 for a hackney carriage license—paid by the owner to the police authorities at Scotland Yard—and 15s. for carriage duty—also paid by the owner to the inland revenue.

Before, however, the owner can get his license, his vehicle must be seen and inspected by the police. Clerkenwell police station is the chief center, and here on Mondays, Wednesdays and Saturdays there is an official in attendance to examine cabs and issue the two number plates, one to be fastened on the inside and the other, the larger one, to be fastened outside at the back.

Every cab is examined and licensed once a year. As a check on possible negligence the back plate has a device on it as well as a number. This year it is the royal arms, next year it will be a crown, and the year after the royal arms again; so that a po-

lice officer may tell at a glance how matters stand with a cab under suspicion.

The ordeal of examining a cab is not severe. The official glances over it and produces a pot of yellow ochre, a shaving brush and a stencil plate, and on the body of the cab at the back he marks the device of royal arms or crown and underneath the word "Approved" and the initials of the chief commissioner—"E. R. C. B." Once the stencil mark is stamped and the number plates fixed the cab can begin business.

When a driver first goes to Scotland Yard for his license he is put through a sort of informal examination on his knowledge of the great railway termini and the public buildings, but no sort of test of his driving capabilities is made; those are always assumed as a foregone conclusion, and he is given a license and badge on payment of 5s.

Then he makes his way to a cab yard, leaving his license with the proprietor, and is given a cab and horse, for all of which he pays 17s. a day. His whip, mackintosh, cape, knee apron and oil flask are at their own expense.

Some drivers own their own hansoms, which are generally of the rickety variety and should be avoided.

If a cabbie drives a smart hansom he haunts clubland, and a day may bring him in a rich harvest—30s., perhaps, and only working eight hours. Some men work sixteen hours a day, but old hands never more than twelve hours, if they can help it.

It takes cabbies some years, sharp as they are, to learn the way of London society, and to elude that ever-vigilant person, the young "bobby"; for, before he knows it, cabbie may find himself at Marlborough station charged with loitering. It may be his first offense and he is let off with 2s. 6d. fine, with two extra shillings for costs.

The cabbie of the old school, whom one sees but very rarely nowadays, wears the triple coachman's cape and a very rusty, out-of-date tile; his temper is not of the best; having been harassed by the police and suspected by the public for years, he has grown to look upon himself in the light of a licensed buccaneer, to whom every passenger is lawful prey.

The young and modern cabbie is different, however. He feels friendly with the general public and wears a stylish overcoat and a shining top hat that does much to attract fares. Sometimes he is handsome and distinguished looking, in which case one is apt to suspect him of being a crushed peer of the realm, some wayward "second son," or some gentleman of fallen fortune who has taken to cab driving as a last resort for an honest living. Indeed, such cases are not rare, and why should not one speculate about one's cabbie if he be fair to look upon?

There are in London several societies for the benefit of cabmen, the two most important being the Cab Drivers' Benevolent Association and the Southwestern Friendly Society. The former society grants annuities to aged drivers, gives legal assistance and grants loans without interest to members. The Southwestern Friendly Society, on the other hand, is self-supporting, it has over 700 members and is in all respects exactly what a friendly society should be.

Then there is another body called the Shelter Friend Society, the object of which is to look after the little buildings called "cabmen's shelters," that one sees huddled up against the curbstone at intervals all through the streets of London. In these shelters there is a wholesome lunch provided with hot coffee or tea for a small sum, and here are toilet conveniences and a stove where cabbie may warm his fingers and toes in severe weather.

The attendants of these shelters are usually retired cabbies. They pay a small rent and run the shelters for the general society. These places are very cozy and inviting, and on pleasant summer afternoons one may hear shouts of laughter from the open windows and then one may know some jovial cabbie is regaling his companions with a joke about some luckless passenger who knew not how well cabbie could use his ears and eyes through the little oblong trap door in the roof.

Wood-working and Smithing

METAL PANELS VS. WOOD.

The construction of the motor body would long ago have been grabbed by the engineer if it had been possible for him to have applied his straight-jacket methods of construction to the subtleties of the coachmakers' art in building motor bodies.

The engineer's methods are rigid, they partake of the plumb line and spirit level too much for even to blend the law of curves to any striking advantage in motor carriage building. The man of cogs and cranks does not understand the graces as they are evolved in the linear design of a motor body, hence he is always at obtuse and right angles to himself in everything that he lays his hands upon in the building of motor body work.

But ignorance is ever positive. It is ever right, and never convinced of error until disaster overtakes it.

To have a clear proof of the failure of metal paneling as a means of strength, or as a painting surface, it is only necessary to work the hand round the corners of any body with rounding corners to find that the sagging of the body framework through a want of strength in the stiffening of the panels, and also through lax methods of fixing to the framework has allowed the panels to flatten and line bulge, through this weakness in rigidity, in response to the straining force brought to bear upon the body from the chassis when the car is on speed generally.

Fig. 1 shows the top corner seat quarter of a body built on the principle of the Roi-de-Belge design or simply with rounding corners, it is not of any consequence which; while Fig. 2 shows the plan of the top and bottom of the rail and seat. The angle from the square line allows the corner battens to be shown in plan.

Now if the framing of the quarter is not sufficient of itself to prevent sagging and when stiffened with a metal panel of aluminum, the rigidity is not increased enough to prevent the softness of the metal from sinking on the batten lines of the corner framing at 3, 4, 5, in Fig. 2, and showing themselves as in Fig. 1, at A-W.

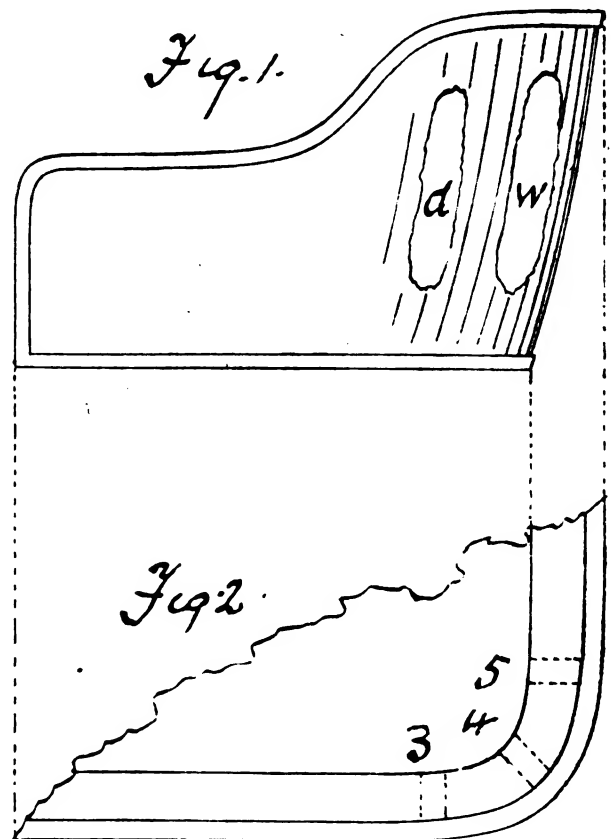
On a car being repainted and varnished these blemishes show themselves up most conspicuously to the eye. A mahogany panel would not show these defects if put in properly, and of 7-32ds substance, properly canvassed and blocked. The quarter is then very firm and sagging impossible, while a good and proper surface is offered for painting, which is not obtainable with metal as it has the property of throwing up an oxide which kills the adhesive qualities of pigments forming the basis of carriage painting. Should the enameling expose the surface of the metal weather gets in and sets up a corrosive disease fatal to the surface, causing it to crack and chip off.

A metal panel cannot be put in with that firmness that a mahogany one can. These metal panels, whether of aluminum or of pressed sheet steel, are fixed to the framing with fine screws and the jointing covered over with metal moulding, which is again fixed with fine screws and the heads filed off level with the surface, thus making a clean job, but should the panel have to be removed for repair, it would be very difficult to take the moulding off without damage to the framing and moulding alike.

A mahogany panel correctly fitted to the curves of the quarter makes a solid job, and is the finest surface to build up a base for painting upon. Wood absorbs the composites of color and holds with a natural firmness the adhesive constituents of the pigments coated with the brush. With metal this important property is absent, and color holds to it solely through the balance of the color itself, which must have a cer-

tain elasticity in the process of drying that will hold the metal in check from the effects of temperatures in setting up oxidation, which is the great danger in using metal sheeting as paneling for motor car bodies.

Referring to the flattening of corner surfaces in metal paneling (defects not quite of this character, but offensive to the eye for all that) are sometimes visible in wood paneling, as the result of canvassing. All panels should be canvassed before they are put in. It is the practice with many body makers in putting curved corner panels into mail phaeton bodies to canvas the corners of the panel on the outside, as a matter of protection to the fibres of the wood in helping them to stretch



on the outside, and contract on the inside when the panel is being bent and forced into its position in the framing.

But canvassing the corner of a panel as a means of protection and help in bending is open to objection because the object to keep in view is pliancy, and canvas holds this in check.

The best method, at least so far as the experience of the writer goes, and he has tried both, is to dress the panel to an equal gigger groove thickness all over its surface, and when ready to put in, to damp the corners with hot water for about an hour before bending, until the fibres of the wood become completely saturated and in a degree pulped, then put the panel in. Care being exercised, there will be no trouble experienced in putting it in, and it will be found more reliable than canvassing, and not so liable to crack.

Before the panel is put in the corner batten should be taken out, as that tends to cause the panel to crack—when the panel is in, and all the framing screwed home to its bearing it would be canvassed and blocked on the inside.

Panels that are canvassed after they are put in, that is on a

flat surface, are drawn to the battens by the glue contracting the fibres, and the line of the battens are thus shown through the panel after it is painted and varnished. It is, therefore, best to block the panels before canvassing, or canvas them before dressing up, and fit them in canvassed and block to the battens, which will prevent bulging or buckling, and also prevent the line of the battens showing themselves on the outer surface of the panels after painting and varnishing. Of course in a motor body quarter such as the illustrations explain, canvassing must be done after the panel is in. Metal panels are a failure from a coachmaker's standpoint, and are an adaptation from the engineer's limbo of sheeting. But the art of coach-making and that of engineering are very wide apart. The engineer can attack the motor with success, but he must leave the motor carriage building alone.

NATIONAL FEDERATION OF RETAIL IMPLEMENT AND VEHICLE DEALERS' ASSOCIATIONS.

The twelfth annual convention of the National Federation of Retail Implement and Vehicle Dealers' Associations was held October 17-19 at the Lexington Hotel, Chicago, Ill., Joseph G. Baker presiding. Mr. Baker stated that the associations belonging to the Federation were all in good condition, and making substantial progress, attracting to their membership the better class of dealers. He said they were accomplishing much in an educational way. He also recommended the endorsement of the one cent postage idea.

Secretary H. J. Hodges' annual report touched upon cost, educational work, the parcels post, express rates, freight matters and farm paper advertising. A committee from the National Implement and Vehicle Association met with the Federation in the afternoon and discussed several matters of mutual interest.

The second day of the convention was taken up with a discussion on advertising and another on freight charges. Cost education and the parcels post claimed a share of attention.

The third day's session was devoted to the reading of a very satisfactory report of the Thresher Committee, Federation finances and the report of the Committee on Resolutions. Parcels post received its usual condemnation and penny postage was endorsed. It was urged that express companies be put under the jurisdiction of the State railroad and warehouse commissions and be made amenable to the Interstate Commerce law. The following officers were elected:

President—O. Gossard, Oswego, Kas., Western Association.

Vice-President—F. R. Sebenthall, Eau Claire, Wis., Wisconsin Association.

Directors—T. G. Wiles, Cherokee, Kas., Western Association, and W. L. Derry, Vermont, Ill., Illinois Association.

After brief addresses by Messrs. Gossard and Sebenthall the convention adjourned.

TWO-CYCLE MOTOR DEVELOPMENTS IN FRANCE.

Among the tendencies of Continental manufacturers is one towards the adoption of two-cycle motors for service in motor cars. The present season is not the time when European manufacturers bring forth their 1912 models (it is only in America that new models are brought out eight months before they are due), and it is, therefore, too early to say what the constructors have in store for next year. But, from inside information, and visits to the various French factories, it is evident that next year will see more attention paid to the two-cycle motor than has been accorded it in the past. The move is significant by reason of the small amount of interest hitherto shown in this type of motor on the other side of the Atlantic, it having been given to a few American makers, and especially makers of boat engines, to develop the two-cycle. But the

recent stirring up of interest in the valveless motor has also aroused fresh interest in the two-cycle, with the result that more than one important French firm is experimenting with a motor of this type for next season. The revival of interest is also shown in the entry of two sets of two-cycle motors in the forthcoming race at Boulogne-sur-Mer. One of the firms is Cote, with motors that have long been on the market, and the other is the Koechlin Brothers, with an entirely new type of two-cycle motor of their invention. The appearance of these motors in a public test will do much to remove the ignorance and prejudice—for the two nearly always go hand in hand—existing against the two-cycle. Reference has already been made to the large amount of experimental work being carried out in France with valveless motors. This can be further supplemented by the announcement that two other firms, both of considerable importance, have secured licenses for the construction of a valveless motor not yet shown to the public; and one of the most important factories in France, whose products are highly appreciated in England, has just completed tests of a valveless motor of its own design. This does not necessarily imply that the new models will be put on the market immediately, for before any reputable firm risks its reputation with a new model, it carries out most exhaustive tests; but the bare announcement is sufficient to show that Continental firms are quite willing to believe that qualities may be found in the valveless which are absent in the poppet-valve motor.

THE NATIONAL IMPLEMENT AND VEHICLE ASSOCIATION'S CONVENTION.

The eighteenth annual convention of the National Implement and Vehicle Association was called to order at Congress Hotel, Chicago, on Tuesday, October 17, for a three days' session.

Edwin D. Metcalf, Auburn, N. Y., made the opening address, which was followed by the report of the Executive Committee, and that of E. W. McCullough, secretary and general manager. The membership now consists of 271 members, of which 147 are on the active list. The report of the Committee on Freight and Transportation was presented by W. J. Evans, Chicago.

At Wednesday's meeting J. B. Bartholomew, Peoria, Ill., addressed the convention on the subject of "The Peoria Permanent Exhibition Plan," after which reports of various committees were read. The Committee on National Legislation presented recommendations covering Canadian reciprocity, the consular service, merchant marine, patents, the monetary system, employers' liability, parcels post and the tariff. "The Cost of Doing Business" was discussed in an able address by C. M. Johnson, Rush City, Minn.

At Thursday's session the report of the Patents Committee was read, followed by those of the Cost Committee and the Committee on Dealers' Associations. The standing committees on fire insurance, credits and terms and industrial indemnity also presented reports full of valuable information. After the noon recess Ferd C. Schwedtmann, chairman of the Committee on Industrial Indemnity Insurance, of the National Association of Manufacturers, lectured on "Accident Prevention." This address was illustrated by numerous lantern slides. The following officers were chosen:

President—Frank C. Johnson, Springfield, O.

Treasurer—C. A. Pattison, Peoria, Ill.

Secretary—E. W. McCullough.

After selecting Detroit, Mich., as the place for holding the next gathering, the convention adjourned.

THREE-WHEELER DECLARED AN AUTOMOBILE.

According to the decision of Judge Walter H. Clark, in the Police Court of Hartford, Conn., the three-wheeled Motorette, manufactured by the C. W. Kelsey Mfg. Co., is an automobile and not a motorcycle.

HOW IT LOOKS.**(Illustrated on Page 269.)**

We show the perspective view of the chassis of the Bowling Green Motor Car Co. on another page. The power plant is suited to commercial work, with kind of bodies hung to suit the needs of the user.

Speaking of the clutch particularly, the makers say: "As you will notice, is of the expanding dry plate type, contact surfaces being rabestos, manganese bronze, cast iron, rabestos and steel. This is absolutely the best constructed and most perfect working clutch on the market. Our clutch means much for a good many reasons. First, there is nothing to get out of order. Second, it is always accessible and is not affected by heat, cold, grease or dirt, and it is impossible to shock the gears or cause unnecessary wear or strain on the tires."

We especially make mention of the model A car of 2,000 lbs. capacity, equipped with 36x3 in. front and 36x3½ in. rear flange truck tires; heavy pressed steel (special alloy steel) frame; 4-cyl. 30 to 35 H. P. motor; large selective sliding gear transmission, 1½ in. width of face on low gear; two sets of large inclosed brakes; radiator mounted on inclosed spring suspension, taking all shocks; high tension dual ignition with storage battery, also double high tension independent system. This model "A," with department store body, when used for high speed delivery purposes, is furnished with 36x4½ in. pneumatic tires.

Also the Model "B", which has a capacity of 500 to 1,000 lbs.; built heavy and strong; standard equipment is 32x3½ pneumatic tires, also 33x4 for special cases or 30x2½ in. solid tires. This model is made up both with side chain drive and shaft drive to rear wheels. Motor is a 4 cylinder, block casting, 22 H.P. This is equipped with selective sliding gear transmission, 1¼ in. width of face on low gear; made both with hood or seat over engine construction. Equipped with dual high-tension magneto and altogether it is made along the same lines as the Model A, it merely being a lighter car and having shaft drive in special cases.

PEERLESS BEAUTIES.**(Illustrated on Page 270.)**

The two examples of Berline Limousine and Peerless Limousine we illustrate are excellent styles. The finish the company gives to its work in the matter of trimming and painting is best appreciated when seen. The body designs are up to best French style, from which the inspiration seems to be derived. We are always pleased to have the opportunity to show Hub readers such vehicles.

GOOD WHOLESALE WORK.**(Illustrated on Page 271.)**

The page of illustrations are given in miniature in order to present a wider range of examples of work now being turned out by the George Delker Co. at their shops in Henderson, Ky. We think such an exhibit is more satisfying than a mere single large cut or two.

The reputation of this concern for thoroughness is much ahead of any mention we can make, because years of keeping at it with strenuous goodness of quality makes reputation travel fast and far.

JACKSON 29.**(Illustrated on Page 270.)**

The small cut of the Jackson Automobile Co.'s Model 29 is an example of a very strong, efficiently engined car, that does not balk at hills or sandy roads. A few of the mechanical details of this two-passenger roadster type are:

Four cylinder motor, cast in pairs, with three-bearing crank

shaft. 4 inch bore and 4 inch stroke. Valves inclined at 45 degrees in cylinder heads, and operated by overhead camshaft. Unit power plant, with self-contained oiling system. The motor is water-cooled, circulation by the thermo-syphon system. Selective sliding gear transmission, three speeds forward and reverse. Transmission housing incorporated in unit power plant, with multiple disc clutch running in oil. Both transmission shafts on annular ball bearings of the separated ball type.

Body, blue; gear, ivory white.

Suspension is full elliptic springs front and rear. Frame dropped to bring the car close to the ground and still allow ample spring action. Front axle of the I-beam type. Tie rod behind and steering arm above the axle.

COMING SHOWS.

Allotments of space have been made for all the shows sanctioned by the Motor and Accessory Manufacturers. The M. & A. M. has sanctioned the Garden Show of the A. B. of T.; the Palace Show of the N. A. A. M.; Boston pleasure and commercial shows and the Chicago National Show. The organization now has 222 members. It is expected that practically 150 of these concerns will have space at the New York shows and about the same number at Chicago. The Boston shows always have a large number of locally made accessories that are not shown elsewhere, but the indications are that there will not be more than 150 M. & A. M. concerns there.

Action against independent manufacturers who have exhibited at sanctioned shows in the past has not been contemplated and independents will have a chance to exhibit their wares at the big shows.

The basement of the Madison Square Garden will be used largely by exhibitors who are not members of the M. & A. M. and there will also be some space in the galleries for such concerns.

The drawings for space have been made as far as the A. B. of T. show is concerned, but so many alterations will be made in the interior arrangement of the Garden that there may be a number of changes in spaces. The drawing for space for the Palace Show took place October 4. and will be a large and complete automobile exhibition. The independents who exhibited at unsanctioned shows last year are eligible for reinstatement or have been reinstated and several of these companies have applied for space.

The show contemplated by the Automobile Manufacturers' Association of America, and which was scheduled for the Palace, is uncertain. Secretary Longendyke has not announced recently the date for holding this show.

The show season of 1912 will be larger and better than ever before.

NEW COMMITTEES.

The Automobile Board of Trade announces these committees for the year. General advancement of the trade will be the main motive of the committees:

Patents: C. C. Hanch, W. H. VanDervoort, L. H. Kittredge, A. Macauley.

Trade: H. O. Smith, E. R. Benson, W. E. Metzger, C. W. Churchill, W. T. White.

Statistical: Benjamin Briscoe, E. P. Chalfant, J. S. Clark.

Show: George Pope, Alfred Reeves, M. L. Downs.

Legislation and Law: G. H. Stilwell, Wm. B. Hoyt, Albert L. Pope.

Intercourse and Arbitration: G. E. Daniels, W. C. Shepherd, J. W. Gilson.

Good Roads: R. D. Chapin, S. D. Waldon, J. N. Willys.

Publicity: Alfred Reeves, E. R. Estep, H. W. Ford.

Mechanical Co-operation: A. L. Riker, D. Ferguson, F. B. Stearns, C. W. Nash, H. E. Coffin.

Carriage and Automobile Painting

DOING IT QUICK FOR LITTLE MONEY.

There is a one-coat paint for exterior house work, there is a quick makeshift for about anything that the painter finds it to his hand to do—if he is out “to do.”

Same way in finishing a job of painting on a vehicle in for repairs, do as much as the money calls for, allowing always for the profit of the workmen. You live by profit, so see that it is forthcoming.

This sounds as if it was a good many miles from the ethics of the trade, but you are dealing with the patron who does not want to pay out so much, so should have so much.

The skill in doing a job of this kind consists in making one swipe of the brush do its full duty.

Don't unhang the body, and if you think the weather is going to mark “set fair” for at least a day and a night, do it outside in the open. Jack the axles up on boxes so the wheels will have a free swing, and go to cleaning off with as little labor as possible. You can't wash up, as you have no time to throw away, so get it clean enough to not ruin your brushes, and peg away.

Benzine and a piece of rag or burlap will get away with the grease from the hubs, fifth wheel and so on. A good sand-papering will remove the roughness from panels, and if chafe spots develop touch them up with the color it is intended to use on the job. Then wipe off after a minute, as that will let the bare spots soak up enough color. The same plan goes with bare spots on the wheel rims, or in fact, any old place the needs of the work suggest.

When opening the tin of the paint you intend to use stir it up well from the bottom of the can, and let it stand to the air for a time.

About an inch and half brush is the thing for a buggy job, if you have a steady and confident hand. It is also good to have an inch brush.

Say you have two brushes, commence at the top of the lazy-back by drawing the one-inch brush well charged with paint from one side to the other (horizontally), put plenty of paint on, see that every spot is covered, then draw it down the sides the same way, then across the bottom, change to the biggest brush, and rapidly place a coat all over the lazy-back; don't try to lay it off or brush it out nice, place it as nearly the same all over as you can until the panel is covered.

Now wipe your brush on the tin cup so as not to carry any more color to the panel, draw it from top to bottom rapidly, missing no part of the panel, bear a little on the brush, and let it be nearly full length of hairs flat on panel so as to insure perfect contact of the coating. Wipe your brush nearly dry, then, commencing at the top, draw lightly and quickly from left to right with almost the point of the hair, work so right down to the bottom and leave it.

Use the paint the same way you would work varnish. When it is spread good and even get away from it as quickly as if you were called. Rapid work must be the rule as these paints set quickly, and are liable to show brush marks if you dally. If you think you cannot work the whole panel, begin at the top and work down, brushing out as you go. Never stay with varnish long enough to feel the brush begin to drag or hang to it; there are men who never cross-brush varnish, and I feel it is worth while repeating, spread it evenly and get away from it as quickly as you can.

After the lazy-back, commence on the seat (off side), and work around to nigh side, then on panels, commencing at front of off side and go around, doing one panel at a time. Always do the best you can. It's important to your success to have the

name of being a good finisher, but it's more important to deserve the name.

QUALITIES OF COLORS.

Chrome yellow is best used as a quick color. When mixed in oil it loses its covering qualities; by using it ground in size, the density is much greater, and naturally will wear longer. The same remarks will apply to orange chrome. A variety of shades may be had by mixing the two chromes. Adding burnt sienna or umber tones down the lemon chrome, and for an old gold shade, add a pinch of Prussian blue and sienna. A very nice warm aspect can be given to this latter color by lightly glazing with burnt sienna.

Green is a pigment having good body, and for fine lines it may be used as an oil color, using patent driers as a drier in preference to a liquid drier; for heavy lines, quick color will give best results. In all cases this green in a variety of shades is made from Prussian blue and lemon chrome. To give a lighter tone, add tub lead. Green lines may be glazed with verdigris. Another nice glaze is yellow lake, but this glazing is only necessary on heavy lines. On fine lines it is time wasted.

Reds are the most troublesome for the painter for lining purposes. For very fine lines, the Chinese vermilion stands pre-eminent, having a good body and standing well; the only objection is the shade being rather light in color. This may be mixed in oil three parts, and turps one part. It requires no grinding more than mixing with the palette knife. Patent driers lighten, and terebine or liquid driers will darken this pigment; consequently it is much safer to use sugar of lead as a drying agent. Carminette, if used in this way, will give you a line that has poor body, and will fade quickly; yet, for picking out lines, mixed as an oil color, it is just the reverse. By using the sable picker, you get a good body of color on, and it will stand and keep its color with the best. This point will illustrate the opening remark, that in many cases the size of the stripe governs the medium used when mixing lining colors.

In the case of blues, for fine lines it is advisable to mix your color from tub lead and Prussian blue in oil, using patent driers; but if ultramarine blue is used, it is much better to mix as a quick color. When oil is used in combination with ultramarine, the latter loses its covering power, and floats to the top. Ultramarine is generally used for picking out lines on light colored grounds, and it is almost impossible to get solid work with this pigment.

For black picking out lines, mix drop black in equal parts gold size and turps; but, for fine lines in black, mix vegetable black equal parts raw oil and gold size, with turps as a thinner. The greasy nature of this black requires a good proportion of driers, or it may be mixed in raw oil, with patent driers added instead of size. This then becomes really a dark lead color, but for fine lines this would not be noticed.

THE MACK STRIPERS.

Andrew Mack, of Jonesville, Mich., has one of the biggest little businesses in the carriage and auto trade. Mack's Stripers are known the length and breadth of the land. He can furnish testimonials of carriage manufacturers, brush supply houses, painters, etc., a mile long. These brushes are made with loving care and under the personal supervision of Mr. Mack, who knows what the “Brother Brush” needs. Mr. Mack issues a booklet covering the kind of brushes he makes, which he will be pleased to send to anyone who will ask for it.

NEW SWINEHART CATALOGUE.

The Swinehart Tire & Rubber Co., Akron, O., is mailing to the trade a descriptive catalogue covering solid and cushion rubber tires for the carriage trade. This catalogue it will be pleased to mail to anyone who is interested in carriage tires. Several concerns who have been making tires for the carriage trade are not giving very much attention to this line on account of being too busy with truck tires, pneumatic tires, etc., so Swinehart's announcement of their position to supply the wants of the trade will be most acceptable news to many.



Top row; left to right—A. T. Barder, Chas. J. Parker, W. K. Gardner, J. F. Lemmon, G. L. Moore, F. C. Boss, W. E. Boyle, W. J. Kreuder, H. L. Houk, G. A. Dodge. Middle row—M. J. O'Connor, B. T. Hadley, L. H. Brainard, F. E. Partridge, C. O. Dail, L. J. Long, Mr. Grey, F. H. Pierce, G. E. Grimes, J. A. Kuehlborn, A. T. Carnahan. Bottom row—F. D. Wait, E. O. Hoopengartner, J. J. Thompkins, A. J. Green, W. W. Wuechter, R. A. May, C. O. Baughman, C. W. Harris, S. G. Andrews, F. H. Burgher.

SCHILDWACHTER TO PUSH THE McINTYRE.

One of the oldest builders of horse-drawn vehicles in New York City has undertaken the marketing of commercial motor vehicles. This is the Schildwachter Carriage Company, with a factory at Park avenue and 128th street, and show rooms at 57th street, near Broadway. The vehicle it is undertaking to market here is the McIntyre, made at Auburn, Ind. A. Reis Meyer, formerly with the McIntyre Co., is now associated with Schildwachter, and it was in recognition of the vast possibilities represented in the New York market that Mr. Meyer came to New York.

The McIntyre is made in three models—1,500, 2,000 and 3,000 pounds capacity, of 20, 24 and 35 horsepower respectively. The two smaller models have two-cylinder opposed motors, while the largest model has a four-cylinder vertical motor. The transmission is planetary, although a selective sliding gear is optional on the two larger models. The final drive is by double side chain.

The Schildwachter factory uptown has extensive facilities for a commercial motor vehicle service department. There is a large repair shop, and, in addition, a long established body building plant is available.

LA CARROSSIERIE AUTOMOBILE.

This is the title of a new French journal in the automobile industry treating the subject more from the point of view of the fashions and furnishings of the automobile body part. The color fashion plates are very fine and the 15 pages of text, working drawings and illustrations are very nice indeed. It is published by Eugene Riegel, 5 Passage d'Orleans, Neuilly-sur-Seine, France, and the foreign subscription price is 44 francs (\$8.80).

CUTS ON TIRES.

One of the folders on the causes of tire breakdown, issued by the B. F. Goodrich Co., of Akron, O., deals with small cuts, their neglect and proper treatment.

The condition shown in the accompanying cut is a familiar one to most tire users. When a small cut extends to the fabric, it allows water to enter. The fabric, acting as a lamp wick, absorbs this water, and deterioration starts far from the original cut. Sand then enters the opening and "blisters" follow.

Such neglect is bound to cause trouble, and is entirely unnecessary when so simple a compound as Plastic may be quickly applied with no trouble or muss. Tire users should be taught to look after their tires in this way occasionally. The result would be dollars in their pockets.



NEW FRANKLIN POLICY.

Franklin motor cars are now being built under the "no-yearly-model" policy. Production is in series. Changes will be made in the cars as soon as available, and in accordance with this policy. The elimination of the auxiliary exhaust and the simplification of the air-cooling system is announced. The motor—as now constructed, has fewer parts, it is claimed, than any other four-cycle motor built, not excluding the sliding valve type. The present system is similar to that of 1911 except that there is no exhaust valve at the base of the combustion chamber. A sheet metal deck, touching the dash and sides of the hood, forms an air chamber above and another below the motor. In the sides of cylinders are vertical cooling flanges about which, on each cylinder, is a sheet metal jacket. The flywheel is a suction fan; as it revolves it draws air in through the front of the hood, into the upper air chamber, down through the air jackets and over the cooling flanges, into the lower chamber and out through the flywheel. The fly wheel is the only moving part.

NOW CALLED ArBenZ CAR CO.

The ArBenZ Car Co. is the new name recently adopted by the Scioto Auto Car Company, of Chillicothe, Ohio. From the time the company called their machine the ArBenZ Car, practically all their correspondents insisted on addressing mail to The ArBenZ Car Co., or some slight variation from this. In order to avoid errors and confusion the change in name of the company was made so as to conform to the name of the car.

NEWARK AUTO SHOW.

Arrangements have been completed for Newark's fifth annual automobile show to be held in First Regiment Armory, February 17 to 24, 1912. The Newark show has ever since its inauguration, had the week of Washington's Birthday, and it has been decided to follow this custom for 1912.

THE EMERSON 1912.

This is the way we characterize the new Emerson 1912 catalogue, a work comprehensive, fine, satisfactory. We congratulate the Emerson Carriage Co. Go to it, dealers, and benefit yourselves.

DEALERS' DIRECTORY.

The Western Retail Implement and Vehicle Dealers' Association has spared no trouble or expense to make its directory as nearly correct as possible. So many changes are taking place that no list can be complete for any great length of time. The information was all secured from members, and no dependence was placed upon the Commercial Agency Reports, which contain errors in classification of dealers and do not distinguish between general stores that carry implements and vehicles and those who do not. The directory was compiled under joint resolution of the association, so it is the proper authority to consult.

THE PARRY CATALOGUE.

This new catalogue from the Parry Mfg. Co. is something nice. We are impressed with the fact that the influence of the motor car builder in his printing taste and lavishness is making its influence felt among the horse-buggy builders. The comparison with the work uttered by the buggy builder of old, and this really splendid effort is like a comparison of B. C. and A. D. We congratulate the Parrys' on their taste, enterprise and the depletion of their bank account for an intelligent purpose. We hope to see the example followed. By the way, the catalogue is also full of Parry buggies, surreys and other good work for the money.

ELECTRIC-PROPELLED VEHICLES.

At the Electricity and Appliances Show in New York in October the space was so generous that much room was given to the demonstration of vehicles. They were trundled over the floor, those interested were permitted to pull the lever and see how it was themselves, and other allurements made the show one of much interest. Examples of the work of the General Electric Co., Studebaker, Rauch & Lang, Broc, Babcock, Baker, Bailey, Detroit-Anderson, Waverly, etc., were conspicuous and most pleasing.

A STRONG "INDEPENDENT."

G. W. Millikan, of Muncie, Ind., has a bending plant that is one of the leaders among the "independents." Its 200,000 bow-sets capacity is a line on what it can do, and as Mr. Millikan is a believer in the cash-on-the-nail plan in buying stock, he naturally is a skimmer of cream, which rises to the finished product, making it attractive in both quality and price.

WITH MOSSMAN, YARNELLE & CO.

Edward Horman is now associated with Mossman, Yarnelle & Co., the prominent carriage supply house of Fort Wayne, Ind. This concern is one of the leading progressive concerns in the accessory line in the West and there is no doubt but that Ed. Horman will make good, for he is a salesman and he has a dandy concern at his back. Both are to be congratulated on the new connection.

WANT PRICES.

J. H. Cloud, Manager of the J. H. Cloud Top Co., manufacturers of automobile, cab, carriage and buggy tops, painting, upholstering and trimming, at 205 E. Ninth street, Anderson, Ind., wants prices on supplies of all kinds.

WHO MAKES THE HAPPY IDEA?

We have an inquiry as to who makes the fifth wheel which goes with the Happy Idea side spring gear. We should be pleased to receive this information that we may answer our subscriber.

LIVE HOOSIERS.

Campbell & Son, of Auburn, Ind., are now located in their new building at 215 East 7th street, which is a dandy two-story concrete structure, and they have splendid facilities for handling their increased business. In addition to their own make of vehicles they are handling the Studebaker line. The department for the building and repairing of vehicles is right up to date. Robert Morehouse has charge of the trimming department; R. C. Capen has charge of the paint department. They are prepared to do all kinds of carriage and auto painting and lettering as well as top making and trimming of all kinds. A horse-shoeing department is also conducted in connecten with the business.

A NICE LIGONIER JOB.

We missed this example of the work of the Ligonier (Ind.) Carriage Co., in our Style Portfolio. When it is a matter of



sunk-panel, auto-seat buggy, our Ligonier friends deserve a place in the procession.

NEW BRANCH.

The Colby Motor Company, of Mason City, Iowa, has opened a branch house at 2009 Michigan avenue, Chicago, in the new building erected this summer. The floor space will be 25 feet front and 150 feet deep and will have repair shop in rear of building. The branch will be under the management of W. H. Ogren, formerly of the Logan Auto Garage Co., at 3229 Fullerton Avenue.

ROAD BUILDING PROBLEMS.

The Agricultural Department in its circular No. 95, has issued a most valuable treatise (illustrated) on special road problems in the Southern States. It is the work of D. H. Wilson, superintendent of road construction, office of public roads. Vehicle makers ought to take a lively and personal interest in getting this pamphlet into the hands of all vehicle owners. It would be the best kind of missionary work.

MORE BONDS.

At a special meeting the stockholders of the United States Motor Company ratified the proposal to authorize \$12,500,000 five-year 6 per cent convertible debenture bonds, \$6,000,000 of which will be sold.

The good offices we do for a man in want, distress, or under reproach, should be known only to those who have the benefit of them.

Trade News From Near and Far

BUSINESS CHANGES.

Dave Stewart has purchased an interest in the Dalton (Ga.) Buggy Co.

Lou Garber has purchased the stock of vehicles, etc., of Puff & Hatch, in Bern, Kas.

May & Scott have succeeded to the vehicle business of C. C. May, in Lexington, Neb.

E. C. Stewart has disposed of his vehicle business in Hamilton, Mo., to Chas. Kelley.

J. F. Lee has disposed of his stock of buggies, etc., in Laingsburg, Mich., to Adolph Byra.

Wickard & Nosker, of Siseston, S. D., have moved their stock of vehicles into new quarters.

E. E. Dill has purchased the stock of vehicles, etc., of Dieter & Dankey, in Madison, Neb.

Ed. O. Laugen has purchased the stock of vehicles, etc., of S. S. Vathing, in Houston, Minn.

E. G. Paul has purchased the vehicle and implement business of A. M. Tate, in Osceola, Ia.

W. C. Timmons has purchased the stock of vehicles, etc., of Bower Bros., in Glenwood, Ia.

O. A. Dicks has purchased the stock of vehicles, etc., of Wayne Munn, in Randolph, Kas.

C. A. Emerson has disposed of an interest in his vehicle business in Jesup, Ia., to F. Hindliter.

Philip J. Scholl has purchased the stock of buggies, etc., of Young & Bernard, in Julian, Neb.

F. P. Marty has disposed of his stock of buggies, etc., in Monticello, Wis., to Joe C. Voegli.

White & Bamberger have disposed of their stock of carriages, etc., in Nevada, Ia., to S. S. Arnold.

S. K. Brown has disposed of his stock of buggies, etc., in Curtis, Neb., to Gordan & Brainerd.

Louis Wieber has purchased the stock of buggies, etc., of Peter Theme, in Westphalia, Mich.

Baldwin & Whittier have purchased the stock of vehicles, etc., of Ellis Oman, in Gothenburg, Neb.

E. C. Newman has purchased the stock of buggies, etc., of William Connaway, in Brashear, Mo.

Walthall & Reeves have succeeded to the Walthall stock of vehicles and hardware in Gridley, Kas.

P. M. Morrison has purchased the stock of buggies and implements of M. Carroll, in Pomeroy, Ia.

J. J. Marthaler has succeeded to the buggy business of J. J. Marthaler & Co., in West Union, Minn.

H. E. Pringle has succeeded to the entire vehicle business of H. E. Pringle & Co., in Webster City, Ia.

The C. C. Cochran Co. has purchased the stock of vehicles, etc., of Ellis & Schwald, in Plainville, Kas.

The Dakota Implement & Vehicle Co. has purchased the business of J. H. Creighton, in Mitchell, S. D.

Owens Bros. have purchased the retail vehicle and implement business of F. G. Peterson & Co., in Carroll, Ia.

James N. Scott has purchased the stock of vehicles and implements of Cullers & Goodwin, in Scandia, Kas.

W. M. Humphrey has disposed of his stock of carriages, etc., in Nashville, Mich., to Silas Endsley, of Hastings.

Chris Olson has purchased an interest in the vehicle and implement business of Thomas Bell, in Palmyra, Neb.

Lembcke & Beck have succeeded Lembcke & Swoyer in the carriage and implement business in Garretson, S. D.

Thompson & Peterson, wagon makers, Boone, Ia., have dissolved partnership. Theodore Thompson succeeds.

The Oskaloosa (Ia.) Garage Co. has taken over the auto business of the Oskaloosa Vehicle & Implement Co.

The H. G. Kennedy Motor Truck & Wagon Co., Seattle, Wash., has changed its name to Kennedy Wagon Co.

Clarence Haley has succeeded his father, Peter Haley, in the vehicle and implement business in Devils Lake, N. D.

Thomas & McKeown have succeeded to the vehicle and implement business of Thomas & Smith, in Tecumseh, Neb.

W. O. Gedosch has purchased the stock of vehicles and implements of McEwan, Dougherty & Daily, in Conway, N. D.

Barker & Grant have succeeded to the vehicle and implement business of T. T. Barker and H. G. Grant & Co., in Cloverdale, Cal.

Foy E. Wallace has purchased a half interest in the buggy,

wagon, harness and real estate business formerly owned and conducted by W. J. Russell at Sherman, Tex.

W. F. Piper has disposed of his implement business in Garrison, N. D., including carriages and buggies, to B. S. Townsend.

E. C. Witten has disposed of his stock of buggies and hardware in Lawrence, Kas., to P. O. Breen, of Phillipsburg, Kas.

W. T. Walls and William Aufderheide, Jr., have purchased the interests of W. B. Myers in the Jacksonville (Fla.) Vehicle Company.

The Spalding Mfg. Co., of Grinnell, Ia., will move its plant to Memphis, Tenn., in the near future. The company manufactures wagons, buggies, and farm vehicles.

IMPROVEMENTS—EXTENSIONS.

The Washington (N. C.) Buggy Co., is about to erect an addition to its plant.

Randolph (Wis.) Wagon Works Co. has increased its capital from \$75,000 to \$100,000.

The Dorris Motor Car Co., is about to construct a new factory building in St. Louis, Mo., to cost \$100,000.

Thomas W. Frotheringham, of Armour, S. D., has moved his stock of vehicles, etc., into new and larger quarters.

The W. N. Owen Sale Co. has just completed a large warehouse at Conway, Ark. The company handles vehicles.

Frank H. Keyes is erecting a new building to house his vehicle and implement business in International Falls, Minn.

The Ft. Wayne Auto Motor Company, of Ft. Wayne, filed notice of increase of capital stock from \$50,000 to \$100,000.

Kelly Bros., of Breckenridge, Minn., are starting a branch vehicle and implement store across the river in Wahpeton, N. D.

The Kentucky Wagon Manufacturing Co., of Louisville, Ky., is rearranging its factory to make motor trucks, delivery wagons, etc.

A new carriage factory for Lock & Co. will be erected at 161-165 W. 83d street, New York City. The company is now located at 218 W. 84th street.

Lambert's carriage works at Ellwood City, Pa., which were destroyed by fire a short time ago, are to be rebuilt at once. It will be constructed of brick.

Plans are being prepared for a factory building for John Immel & Sons, Columbus, O., to be used for the manufacture of electric trucks and for the repair and repainting of automobiles.

Robert Mitchell, Barnesville, Ga., has begun the erection of a big brick building on Jackson street. The building will be used for storage room for buggies and wagons, in which Mr. Mitchell deals extensively.

The Owensboro (Ky.) Buggy Company, owing to the increase in the volume of business is planning to have three stories added to the manufacturing plant and double its capacity for the manufacture of the vehicles. The Owensboro Wagon Company is running with a full corps of employes both day and night.

Ground has been broken for the new plant for the Hupp Motor Car Co., Detroit, Mich., on about 7 acres of land at Milwaukee and Mt. Elliott avenues on the Belt line railroad. The buildings will be of modern mill construction with brick piers and steel sash windows, steel girders to be used in the chassis assembly and paint shop. The three buildings are the assembly and paint shops, 400 by 70 feet; the motor assembly building, 200 by 70 feet; and the stock building, 320 by 70 feet. There will be a two-story office building of vitrified brick, 150 by 45 feet. The entire plant will afford approximately 125,000 square feet of floor space, which is about three times that available in the present factory. The capacity will be 15,000 to 20,000 cars a year.

NEW FIRMS AND INCORPORATIONS.

The Fennell Carriage & Wagon Works recently began business at Moberly, Mo.

The Allen Wagon Co., is about to establish a factory in Le-noir, N. C.

E. A. Snapp is about to put in a new line of buggies, etc., in Oakland, Ia.

At Cedar Rapids, Ia., Messrs. G. C. Schneider, W. Morgan, and D. Stofflet have formed a company known as the Hawkeye

Carriage and Auto Company. They have let the contract for a one-story factory building between Fifth and Sixth avenues. The firm will manufacture all kinds of wagons and auto trucks.

The Mayo Manufacturing Company, Chicago, Ill., capital \$6,000, has been incorporated to manufacture wagons and vehicles by Franklin Mayo and E. D. Chaurets.

Brookshire & Robinson Co., St. Paris, O., manufacturers of vehicles, has been incorporated with a capital of \$60,000 by F. M. Brookshire, H. C. Brookshire, W. T. Robinson, John Schooler and H. L. Pentz.

The Brooks-Latta Co., St. Louis, Mo., capitalized at \$150,000, has put under option a plot of ground at Sullivan and Lambdin avenues, on which it will build a plant for the manufacture of automobiles and delivery wagons.

Tadlock and Pierce have engaged in the vehicle and harness business at Gonzales, Tex.

The maple City Vehicle and Implement Co., Monmouth, Ill. has begun business. J. A. Litchfield is proprietor and William McKinley manager.

Adolph Gaulke plans the erection of a wagon shop on the Port Washington road, Milwaukee, Wis.

T. A. Ankeny has engaged in the automobile and vehicle business in Carleton, Neb.

Ed. Biehl has rented the Haish building at DeKalb, Ill., formerly the Sebree laundry, and will convert it into a carriage and wagon paint shop.

O. B. Willis has opened a new stock of vehicles and implements in Vinsin, Okla.

North American Vehicle Co., Detroit, Mich., has been incorporated; capital \$10,000.

The Hartzog-Hagood Livestock & Vehicle Co., has been incorporated in Greenwood, S. C., with a capital stock of \$30,000.

Chas. A. Robinson is engaging in the carriage and hardware business in Brunswick, Mo.

E. W. Trege is about to open a new stock of vehicles, etc., in Humboldt, Kas.

Clarence Reeder, of Nelson, is about to open a stock of vehicles and implements in Fairfield, Neb.

The Spalding Mfg. Co. has been incorporated in Memphis, Tenn., to make wagons and farm vehicles.

The Chapman Carriage Factory is soon to be established in Jacksonville, Fla., by F. A. Chapman.

Klug & Mizera have engaged in the vehicle and implement business in Morse Bluff, Neb.

The Melbourne Buggy Co. has been incorporated in Melbourne, Ky., with a capital stock of \$20,000.

Kelly Bros. have opened a new stock of vehicles, etc., in Wahpeton, Minn.

The Southwestern Wagon Stock Co. has been incorporated in Lufkin, Tex., with a capital stock of \$50,000.

The Greenback Supply Co. has opened a new stock of vehicles and hardware in Knoxville, Tenn.

The Bearden Buggy Co. has been incorporated in Memphis, Tenn., with a capital stock of \$50,000.

Locker Bettner Co., Newcastle, Ind., to deal in implements, vehicles, etc., has been incorporated with a capital stock of \$10,000 by H. H. Locker, C. F. Bettner and Clara E. Locker.

H. Newacheck, of the firm of Martin & Newacheck, Hutchinson, Kas., has opened a shop at 1009 S. Main street, which will be known as the Hutchinson Carriage Works.

FIRES.

The stock of buggies, etc., of E. S. Dun, in Bryant, Ia., has been destroyed by fire.

The Versailles (Ky.) Carriage Co. was damaged by fire.

At Palestine, Tex., H. L. Cook's implement and vehicle store has been burned out.

The stock of vehicles, etc., of Irvin Williams, in Sprague, Neb., has been destroyed by fire.

Fire damaged the building at 161 North Market street, Chicago, Ill., occupied by E. D. Kimball & Co., wagon makers' supplies.

Fire did \$300 damage to the J. Armstrong Company's plant in Cincinnati.

The stock of vehicles and hardware of Johnson & Co., in White Rock, S. D., has been destroyed by fire.

The stock of vehicles, etc., of F. T. Schunk, in Fullerton, Neb., has been totally destroyed by fire.

TIRE LASTS LONGEST ON WIRE WHEELS.

The Daimler Co., Ltd., has been making investigation into the life of tires on wood and wire wheels and has found that the average life on wire wheels per cover is 3,454 miles, and with artillery wheels 2,050 miles.

OBITUARY

C. C. Schildwachter, aged 84 years, died September 27 at his home in New York City. In 1867 he founded the Schildwachter Carriage Co., Park Avenue and Twenty-eighth street. He was one of New York City's best known carriage manufacturers, a gentleman of the old school, and one who stood for the best traditions of the vehicle building industry. In the early days of the automobile in America, the concern was incorporated and began to build automobiles. The present officers are Christian W. Schildwachter, president; Philip W. Schildwachter, secretary-treasurer. The business has grown considerably in the past few years and a new downtown office and warerooms became necessary, which are located at 249-253 West Fifty-seventh street, near Broadway, in the center of the automobile district.

John R. McLean, 59, proprietor of the Bluegrass Carriage Shop, Decatur, Ill., died October 25, after five months' illness. His death was not entirely unexpected, as he had been suffering from complications, heart trouble and softening of the brain. He was born near Lexington, Ky and moved to Decatur in 1884. He leaves a widow.

Benjamin Falger, 78, probably the oldest resident and business man of New Springfield, O., where he has lived all his life, died suddenly October 11. Early in life he entered the carriage building business, for forty years having a carriage factory of his own.

Harry P. Noake, a pioneer of El Paso, Tex., and wagon and carriage manufacturer, died at his home October 9. He was 53 years of age and leaves a widow and one daughter.

C. Robert Bosche, for more than 30 years proprietor of the automobile and carriage store of Bosche Bros., 920 Main street, Buffalo, N. Y., died October 15, from a severe attack of paralysis. Mr. Bosche was born in Buffalo in 1849. From his youth he was engaged in the carriage business, and in 1880 became senior partner of the firm of Bosche Bros. The deceased was a well known business man, being a prominent member of the Chamber of Commerce, Manufacturers' Club and other organizations. He is survived by his wife, Katherine, one son and two daughters.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department. 5 cents a word; Initials and figures count as words. Minimum price, 30 cents for each advertisement.

HELP WANTED.

Wanted—A first class sales manager for buggies and farm wagons for southern states. Must have first class record and references. Address B., care The Hub, 24 Murray St., New York.

Wanted—Body makers. We can use several first class capable men on high grade coupe bodies for electric vehicles. We can offer steady employment the year round and good wages to first class men. We can also use a few experienced machine hands. The Milburn Wagon Co., 3134 Monroe St., Toledo, O.

FOR SALE.

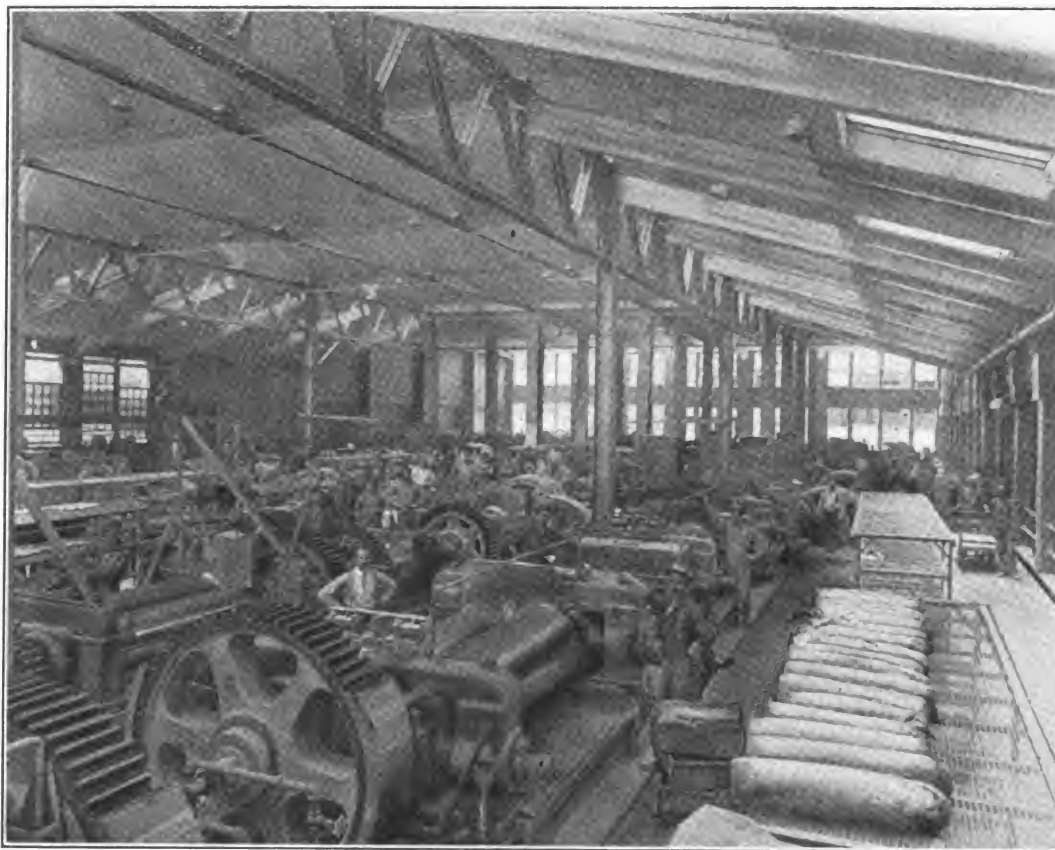
For Sale—Two top stitching and one bow dressing machines cheap. Western Carriage Co., St. Louis, Mo.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

GOODRICH "SERVICE"

The Mill Room



Here the rubber is rolled or milled to give it proper consistency. This is the next step after the cleaning and drying of the crude. In other words, this picture shows the manufacture of rubber. Further on, the rubber is patterned into articles of sale, and cured.

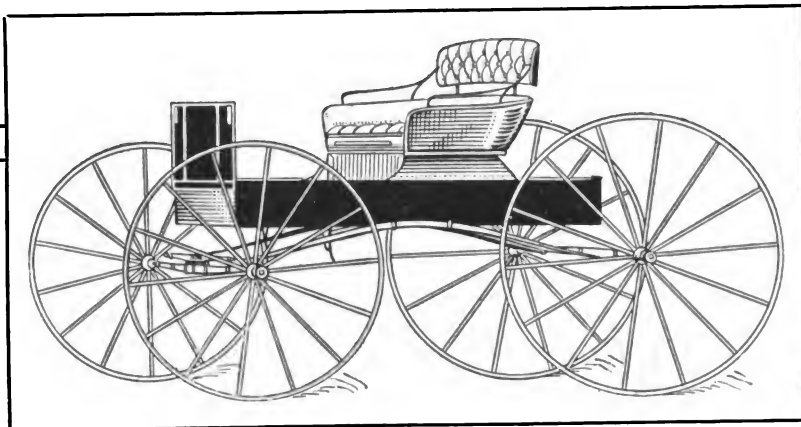
This Department, representative of the equipment of the plant of the B. F. Goodrich Company, is the largest and most completely equipped Mill Room in the world.

The B. F. Goodrich Company

Akron, Ohio.

H. H. BABCOCK COMPANY

WATERTOWN NEW YORK



ONE OF THE LARGEST CARRIAGE BUILDERS IN THE
UNITED STATES

WRITE US FOR CATALOGUE.

THE MODERN CAR FOR MODERN WAYS

QUIET RUNNING BUT POWERFUL

BEST SHOWING in Chicago-Detroit Reliability
Contest. The ONLY CAR in its class making
ENTIRE RUN ON ITS OWN POWER.



Model A—Engine, 30 H.P., 4-cycle; transmission selective;
wheels 36x2, 36x3½ in. solid, capacity 1500-2000 lbs.

Model B—Engine, 22 H.P., 4-cycle; transmission selective;
wheels, 32x3½, 33x4 in. pneumatic; capacity 500-1000 lbs.

The **BOWLING GREEN MOTOR CAR CO.**
BOWLING GREEN, O.

VEHICLES AND GEARS IN THE WHITE



PREMIER
SIDE SPRING GEAR

We also manufacture a full line of
CARRIAGE and WAGON BODIES in the white; also
LIMOUSINE, TAXICAB, TOURING CAR and ROAD-
STER BODIES in metal. Fifty styles of gears for Car-
riages and Wagons; also seats, trimmings and tops of all
kinds. Write to us for particulars.

SCHUBERT BROS. GEAR COMPANY
ONEIDA, NEW YORK

ESTABLISHED 1855

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

AUTOMOBILE WHEELS

For
PLEASURE CARS and TRUCKS

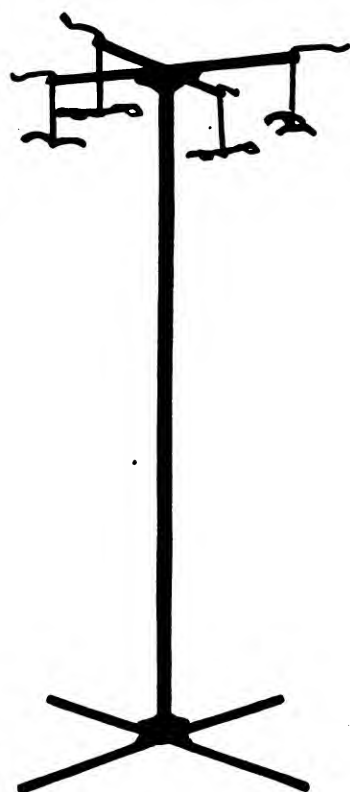
Repairing and truing old wheels a specialty. Experimental
wheels a specialty. We furnish and apply the Standard
Universal Quick Detachable and Quick
Detachable Demountable Rims.

REPAIRING OF AUTOMOBILE TRUCK WHEELS.

Please mention "The Hub" when you write.

INDEX TO ADVERTISERS

Babcock, H. H. Co.	10	Frost Gear & Machine Co.	21	Pierce, F. O. Co.	3rd cover
Balley, S. R. & Co.	22	Flint Axle Co.	20	Porter, H. K.	20
Bicknel Mfg. & Supply Co.	20	Gifford, John A. & Son	21	Racine Auto-Tire Co.	18-19
Bokop, Webb & Palm	20	Goodrich, B. F. Co.	9	Relly, John Inc.	18
Bowling Green Motor Car Co.	10	Higgin Mfg. Co.	4th cover	Richmond Lamp Co.	3
Buckeye Handle, Gear & Bending Co.	22	Hoopes Bros. & Darlington	2nd cover	Russell, Burdsall & Ward Bolt & Nut Co.	15
Buckeye Paste Co.	22	Hotel Cumberland	4	Schubert Bros Gear Co.	10
Burling, W. G.	22	Jones & Co., Phineas	10-21	Shortsville Wheel Co.	6
Cincinnati & Hammond Spring Co.	16	Keystone Paint & Filler Co.	21	Sherwin-Williams Co.	13
Consolidated Rubber Tire Co. 1st & 2d cover		Keystone Sheet Metal Co.	12	Standard Wheel Co., Terre Haute, Ind.	13
Cortland Forging Co.	6	Landers Bros. Co.	19	Standard Wheel Co., Toledo, O.	12
Columbus Bolt Works	4th cover	Lewis Spring & Axle Co.	16	Standard Oil Cloth Co.	4
Crane & MacMahon	2nd cover	Masury, John W. & Son	2	Smith, L. M. & Son	22
"Crescent" Body Works	22	Mayo Radiator Co.	3	Stinson & Son, Edw.	22
Crowe Nameplate & Eng. Co.	22	Millikan, G. W.	22	Straus & Son, M.	14
Decker, J. C.	19	McKinnon Dash Co.	4th cover	Schofield & Co.	22
Delphos Hoop Co.	22	Metropolitan Lamp Co.	22	Timken Roller Bearing Co.	1
Devoe, C. T. & Reynolds Co.	3rd cover	Mohawk Valley Mfg. Co.	18	Union City Wheel Co.	12
Diefenthaler, J. V.	4	Moller & Schumann Co.	3rd cover	United Rim Co.	2
Dowler, Charles L.	22	Murray, Wm. A., Spring Co.	5	Valentine & Co.	3
Dreyer & Son, H. G.	11	National Spring & Wire Co.	14	West Tire Setter Co.	22
Eccles, Richard Co.	20	New Wapakoneta Wheel Co.	1	Woodman, Joel H.	22
Excelsior Seat Co.	14	Ochsner & Sons Co., A.	22	Willey, C. A. & Co.	14
Eureka Mower Co.	20	Payne, E. Scott & Co.	20	Willcox Mfg. Co.	17
Fabrikoid Co.	4	Pettingell Machine Co.	5	Wiggers Furniture Co.	4th cover
Fairfield Rubber Co.	19				



No. 30.
Holds four set of Team Har-
ness. Rack revolves. Price \$7.00

THE DEALER'S SALESMAN

Line of Display Racks

Adopted by the up-to-date dealers all over the
country.

BECAUSE THEY SAVE ROOM THEY SELL GOODS

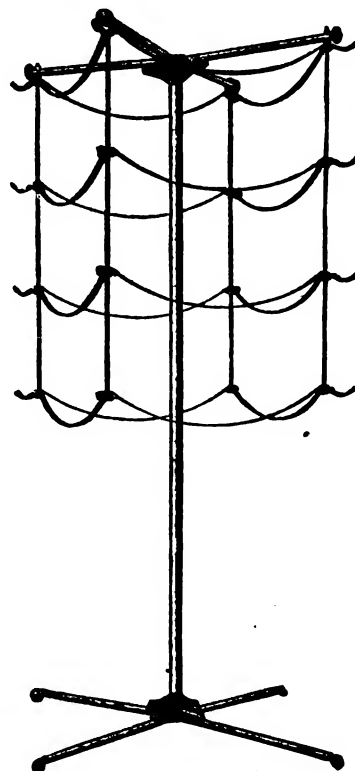
They give an up-to-date appearance to your
show room, and a buyer judges your goods by
the looks of your store.

THEY KEEP YOUR SAMPLES LOOKING NEW AND BRIGHT

They save time in showing your line, and lead
the customer to reach an immediate decision
instead of making the rounds, and perhaps
buying of a competitor.

Sold by All Leading Jobbers

Manufactured by
H. G. DREYER & SON
2256 W. 95th St., Cleveland, Ohio
WRITE FOR CATALOGUE.



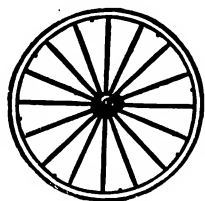
No. 40.
Holds 16 Saddles and 16 Bri-
dles. Rack revolves. Price \$10.00

Please mention "The Hub" when you write.

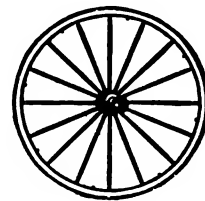
WHEELS

FOR THE

CARRIAGE TRADE



Thoroughly seasoned, carefully selected materials of best Indiana quality. Sarven, Warner and Shell Band Wheels. We operate our own supply plant in Southern Indiana.



Prompt Shipments guaranteed.

SEND FOR CATALOGUE AND PRICES

UNION CITY WHEEL COMPANY

UNION CITY, IND.

All Steel Piano Box Buggy Bodies One Piece Steel Seats



No More Checks, Splits, Corner Breaks



Keystone Sheet Metal Co.

Factory, Economy, Pa.

Office, Ambridge, Pa.

ALL STEEL BUGGY WHEEL

Write for
Descriptive
Booklet

The problem of an all-steel buggy wheel has been solved at last.



Patented
April 20, 1909.

The Standard Buggy Wheel is the acme of perfection in wheels; it has stood the most severe tests; is not affected by heat, cold or moisture.



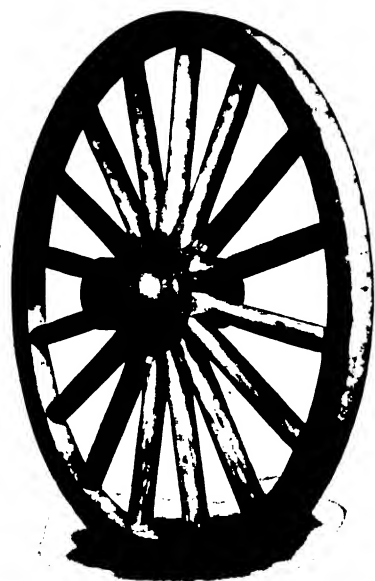
Absolutely no tire troubles. Strong and light, being built of the finest bicycle steel. Practical and durable, will not decay or rust, and is easily repaired.

It is cheap—cheaper than most if length of life is considered.

**THE
STANDARD WHEEL CO.**

TOLEDO, O.

Please mention "The Hub" when you write.



ASK FOR CATALOG

No. 10. Carriage and Wagon Wheels.

No. 15. Auto and Motor Truck Wheels.

WE HAVE—FOR FORTY YEARS MADE WHEELS OF QUALITY

¶ Our experience should be worth something to you.

¶ To buyers of wheels not already on our list of satisfied customers, we offer our facilities for producing wheels for

Carriages, Wagons, Automobiles and
Motor Trucks

OF THE HIGHEST STANDARD OF QUALITY

STANDARD WHEEL COMPANY
TERRE HAUTE, IND.



We can help you standardize
your painting department opera-
tions through our unit system.

THERE is no part of the auto or carriage building trade that is developing faster than the painting department. The demand for quicker work with the same or better results is felt everywhere. You must recognize this demand in order to meet competition. In forty years study of shop conditions, we have developed a complete system of finishes from primers to finishing varnishes which is aimed to standardize every operation in the shop. It promotes efficiency so that the work is passed through quicker, waste of labor and material eliminated, and better results obtained. Each product employed is not only the best that can be made, but forms a perfect bond with preceding and subsequent costs. The final result is a beautiful, durable finish obtained in less time, with less labor and less material. Hadn't you better write for particulars.

THE SHERWIN-WILLIAMS CO.

PAINT AND VARNISH MAKERS

FACTORIES: CLEVELAND, CHICAGO, NEWARK, MONTREAL, LONDON, ETC.
SALES OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

ESTABLISHED
1865

INCORPORATED
1895

M. Straus & Sons

NEWARK, N. J.

Tanners and Manufacturers
of

High Grade- "Beaver Brand"

CARRIAGE,
AUTOMOBILE and
UPHOLSTERY

LEATHER

Office - 440 Frelinghuysen Ave.,
NEWARK, N. J.

WILLEY'S COLORS

The RECOGNIZED STANDARD



C. A. WILLEY CO.

COLORS GRINDERS

and Manufacturers of Specialties in
CARRIAGE, AUTOMOBILE AND CAR
PAINTS

COLORS, VARNISHES, ETC.

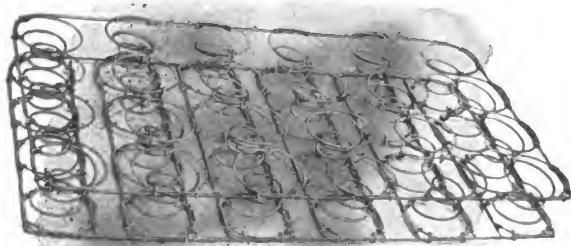
HUNTER'S POINT, NEW YORK CITY

"BLACK VELVET" CUSHION SPRINGS

Manufactured Only by the

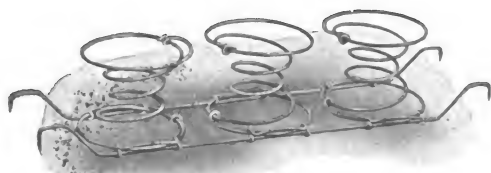
NATIONAL SPRING AND WIRE COMPANY
ALBION, MICH. WINDSOR, ONT.

THE SPRING OF QUALITY.



SPRING or SOFT EDGE CUSHION FRAME

For Buggies or Other Vehicles. Built of the Highest
Grade of Steel Wire.

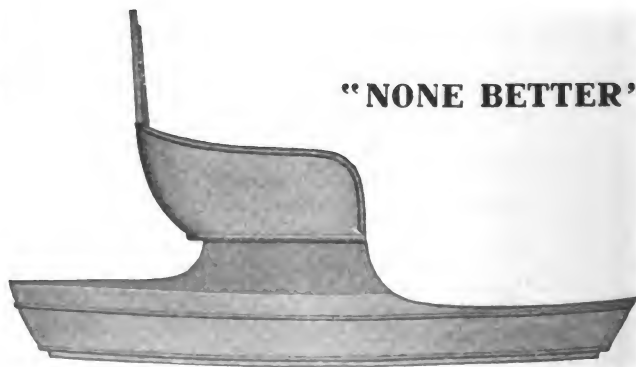


STRIP FOR WOOD OR BOX FRAME

Do You Use

"EXCELSIOR" SEATS and BODIES

"NONE BETTER"



"EXCELSIOR" Concord Body No. 48

THE EXCELSIOR SEAT CO.

Write for Catalog.

COLUMBUS, OHIO

Please mention "The Hub" when you write.

ADVERTISEMENTS CLASSIFIED

AUTOMOBILES

Babcock, H. H. Co., Watertown, N. Y.
Bailey, S. R. & Co., (elec.) Amesbury, Mass.

AXLES

Cincinnati & Hammond Spring Co., Cincinnati, O.
Flint Axle Works, Flint, Mich.
Frost Gear & Machine Co., Jackson, Mich.
Lewis Spring & Axle Co., Jackson, Mich.
Timken Roller Bearing Co., Canton, O.

BODIES, SEATS, ETC. (Wood and Metal)

Burling, W. G., Philadelphia, Pa.
Crescent Body Works, Reading, Pa.
Excelsior Seat Co., Columbus, O.
Keystone Sheet Metal Co., Ambridge, Pa.
Schubert Bros. Gear Co., Oneida, N. Y.
Wiggers Co., Cincinnati, O.
Woodman, Joel H., Hoboken, N. J.

BOLTS AND NUTS

Columbus Bolt Works, Columbus, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

BOWS (Automobile and Carriage)

Millikan, G. W., Muncie, Ind.
Delphos Hoop Co., Delphos, O.

BUCKRAMS.

Landers Bros. & Co., Toledo, O.

BUGGIES

Babcock, H. H. & Co., Watertown, N. Y.
Bailey & Co., S. R. Inc., Amesbury, Mass.
Parry Mfg. Co., Indianapolis, Ind.

CARRIAGE FORGINGS.

Columbus Bolt Works, Columbus, O.
Cortland Forging Co., Cortland, N. Y.
Eccles Co., Richard, Auburn, N. Y.
Herbrand Co., Fremont, O.
Keystone Forging Co., Northumberland, Pa.
Wilcox Mfg. Co., D., Mechanicsburg, Pa.

CARRIAGES AND WAGONS (Finished)

Babcock, H. H. & Co., Watertown, N. Y.
Bailey & Co., S. R. Inc., Amesbury, Mass.
Parry Mfg. Co., Indianapolis, Ind.

CARRIAGE, WAGON AND AUTOMOBILE HARDWARE, SUPPLIES, ETC.

Chas. L. Dowler, Philadelphia, Pa.
Gifford & Son, John A., New York City.
Higgin Mfg. Co., Newport, Ky.
Payne Co., E. Scott, Baltimore, Md.
Landers Bros. Co., Toledo, O.
Mohawk Valley Mfg. Co., Utica, N. Y.

COMMERCIAL MOTOR WAGONS, TRUCKS

Bowling Green (O.) Motor Car Co.

CUSHION MFGRS.

Chas. L. Dowler, Philadelphia, Pa.

COLORS

Pierce Co., F. O., New York City.
Sherwin-Williams Co., Cleveland, O.
Valentine Varnish Co., New York, Chicago, Boston.
Willey, C. A. Co., Hunters Point, N. Y.

DASHES, FENDERS, ETC.

McKinnon Dash Co., Buffalo, N. Y.
Burling, W. G., (Metal) Philadelphia, Pa.

DISPLAY RACKS.

H. G. Dreyer & Son, Cleveland, O.

FIFTH WHEELS.

Eccles Co., Richard, Auburn, N. Y.
Wilcox Mfg. Co., D., Mechanicsburg, Pa.
American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.

GEAR WOODS.

Buckeye Handle, Gear & Bending Co., Alliance, O.

JACKS

Eureka Mower Co., Utica, N. Y.

LEATHER, PATENT AND ENAMELED

Diefenthaler, J. V., Newark, N. J.
Reilly, John, Inc., Newark, N. J.
M. Straus & Sons, Newark, N. J.
L. M. Smith & Son, Newark, N. J.

LINSEED OIL

Sherwin-Williams Co., Cleveland, O.

MACHINERY AND TOOLS.

Bokop, Webb & Palm, Defiance, O.
Porter, H. K., Everett, Mass.
West Tire Setter Co., Rochester, N. Y.
Frost Gear & Machine Co., Jackson, Mich.
Pettingell Machine Co., Amesbury, Mass.

MACHINERY, (Woodworking)

Bicknell Mfg. & Supply Co., Janesville, Wis.
Pettingell Machine Co., Amesbury, Mass.

MOUNTINGS (Including Lamps)

Crowe Name Plate & Engraving Co., Chicago
Ochsner & Sons Co., A., New Haven, Conn.
Richmond Mfg. Co., Richmond, Ind.
Metropolitan Lamp Co., Newark, N. J.

MUFFLERS (Auto)

Mohawk Valley Mfg. Co., Utica, N. Y.

NAME PLATES

Crowe Nameplate & Eng. Co., Chicago, Ill.

PASTE

Buckeye Paste Co., Columbus, O.
Indianapolis (Ind.) Paste Co.

RADIATORS.

Mayo Radiator Co., New Haven, Conn.

RIMS.

United Rim Co., Akron, O.

ROLLER CHAFE IRONS

Mohawk Valley Mfg. Co., Utica, N. Y.

RUBBER TIRES

Autos, Pneumatics, Etc.
Consolidated Rubber Tire Co., New York City.
Racine Auto Tire Co., Racine, Wis.
Carriages, Solid, Etc.
Consolidated Rubber Tire Co., New York City.

SEATS

Schubert Bros. Gear Co., Oneida, N. Y.
Excelsior Seat Co., Columbus, O.
Keystone Sheet Metal Co., Columbus, O.
Schubert Bros. Gear Co., Oneida, N. Y.
Wiggers Co., Cincinnati, O.

SLEIGH RUNNERS.

Schofield & Co., Freeport, Ill.

SHAFT COUPLINGS.

Eccles Co., Richard, Auburn, N. Y.
Higgin Mfg. Co., Newport, Ky.

SHAFT STRAPS.

Decker, J. C., Montgomery, Pa.

SPRINGS (Cushion)

Murray, Wm. A., Cincinnati, O.
National Spring & Wire Co., Jackson, Mich.

SPRINGS, GEARS, ETC.

Cincinnati & Hammond Spring Co., Cincinnati, O.
Frost Gear & Machine Co., Jackson, Mich.
Lewis Spring & Axle Co., Jackson, Mich.
Schubert Bros. Gear Co., Oneida, N. Y.

TRIMMING MATERIAL

Rubber Drills, Enameled Goods, Imitation Leather, Etc.

Fabrikoid Works, Newburg, N. Y.
Fairfield Rubber Co., Fairfield, Conn.
Standard Oil Cloth Co., New York City.
Schubert Bros. Gear Co., Oneida, N. Y.

TOPS

Schubert Bros. Gear Co., Oneida, N. Y.

VARNISHES, PAINTS AND JAPANS

Devoe, F. W., and C. T. Reynolds, N. Y. C.
Keystone Paint & Filler Co., Muncie, Pa.
Moore & Co., Benj., Cleveland, O.
Moller & Schumann Co., Brooklyn, N. Y.
Masury & Son, J. W. New York and Chicago
Pierce Co., F. O., New York City.
Sherwin-Williams Co., Cleveland, O.
Valentine Varnish Co., New York, Chicago, Boston.
Willey, C. A. Co., Hunters Point, N. Y.

VEHICLES.

Babcock, H. H. & Co., Watertown, N. Y.
Bailey & Co., S. R. Inc., Amesbury, Mass.
Parry Mfg. Co., Indianapolis, Ind.

WHEELS AND WHEEL STOCK.

Crane & MacMahon, New York City.
Union City Wheel Co., Union City, Ind.
Gifford & Son, John A., New York City.
Hoopes Bros. & Darlington, West Chester, Pa.
Jones & Co., Phineas, Newark, N. J.
New Wapakoneta Wheel Co., Terra Haute, Ind.
Stinson Edw. W. & Co., Baltimore, Md.
Standard Wheel Co., Terre Haute, Ind.
Standard Wheel Co., Toledo, O.
Shortsville Wheel Co., Shortsville, N. Y.

STEEL WHEELS

Standard Wheel Co., Toledo, O.

WOOD STOCK, BENT WOOD, ETC.

Buckeye Handle, Gear & Bending Co., Alliance, O.
Crane & MacMahon, New York City.
Delphos Hoop Co., (Bows) Delphos, O.
Gifford, John A. & Son, New York City.
Millikan, G. W., Muncie, Ind.

WHITE LEAD.

Sherwin-Williams Co., Cleveland, O.

MISCELLANEOUS

Oliver Typewriter Co., New York—Chicago

BOLTS Rivets, Carriage Makers' Washers
and Burrs for all kinds of Vehicles
Russell, Burdsall & Ward Bolt and Nut Co.
Main Works, PORT CHESTER, N. Y. Branch at Rock Falls, Ill.

Please mention "The Hub" when you write.

All Styles of Springs for Motor and Horse Vehicles

STEELS SPECIALLY HEAT-TREATED



Here is a beauty, and for easy-riding qualities and durability it is without a peer.

CINCINNATI & HAMMOND SPRING COMPANY

909-923 Summer Street, CINCINNATI, OHIO.

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

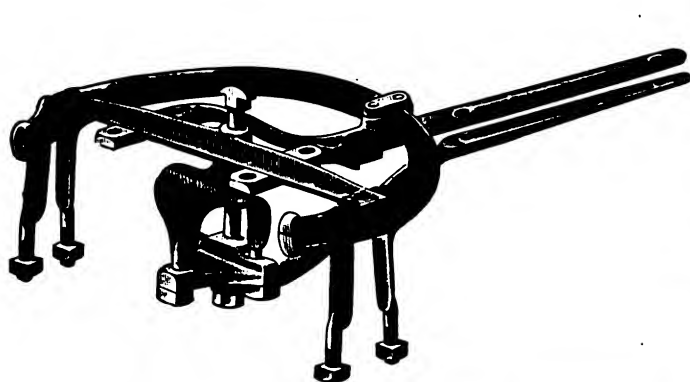
SPRINGS

LEWIS SPRING & AXLE CO.

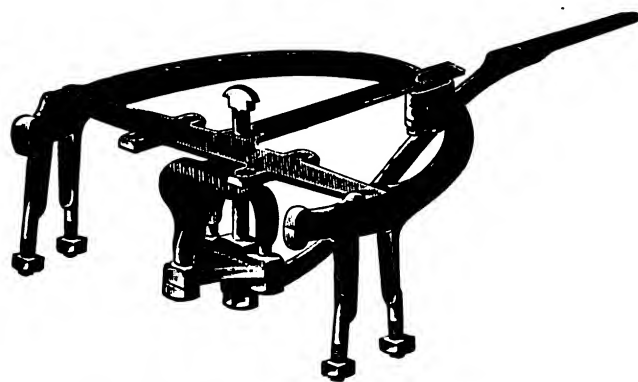
JACKSON, MICHIGAN

Please mention "The Hub" when you write.

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



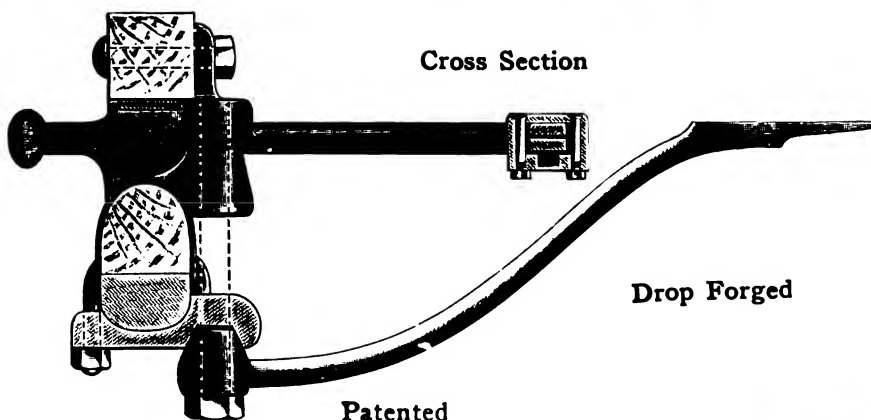
No. 1908—Gear Iron



No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.

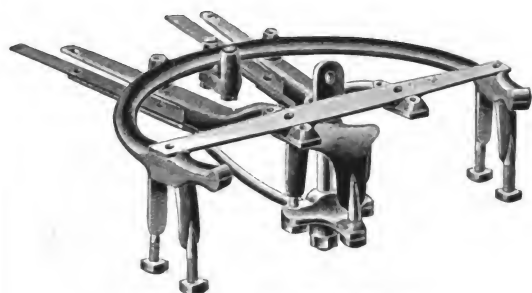


Cross Section

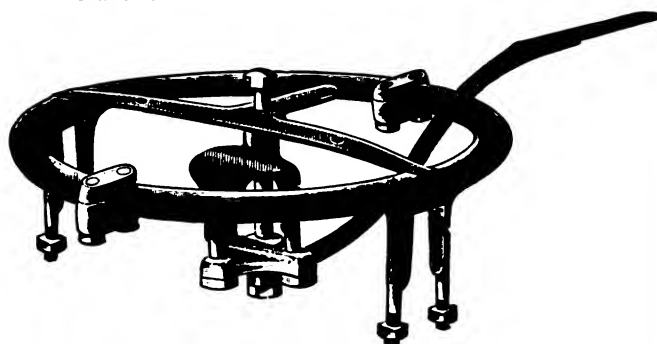
Drop Forged

Patented

S
U
R
E
S
A
F
E



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and ~~that's~~ good news involved in the handling of

THE RACINE AUTO TIRE

We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

ROLLER CHAFE IRONS, VISES AND HARDWARE SPECIALTIES

Largest Manufacturers of Roller Chafe Irons in the World.
We have just what you want for any vehicle, and remember,
WE SHIP PROMPTLY.



No. 32—For end spring jobs with full length body loops.



No. 69—For Phaetons and Stanhopes.

We also manufacture the cheapest and most durable Automobile Muffler in the world. Can be easily attached to any automobile manufactured.

"We are Known as Prompt Shippers"

MOHAWK VALLEY MANUFACTURING CO.
UTICA, . Y.

JOHN REILLY Inc.

Established 1865

MANUFACTURERS OF ALL GRADES OF

LEATHER

FOR THE

Carriage & Automobile Trade

PARTICULAR ATTENTION CALLED TO

OUR AUTO SPECIAL

FACTORIES,

Avenues C & D, Murray & Astor Streets.
NEWARK, N. J.

AGENTS,

Cincinnati—National Hardware Co., Fourth Street
Detroit—C. W. Findlater, No. 313 Forest Ave., West

CUSTOMER·A·SATISFIED·CUSTOMER

BECAUSE, those cup-like studs that you see in our illustration will grip the ground just where, and just when, the ground needs gripping; so that he is free from the danger of skidding and slipping.

BECAUSE, his tire EXPENSE account will show a difference such as will cause him to talk enthusiastically to others about you and the RACINE AUTO TIRE.

All this counts for good business; so get busy. The RACINE AUTO TIRE is going into the hands of live, pushing dealers. We shall make it equally advantageous to them as to us. Be amongst the live ones. Take our proposition. Do it now; and together let us do it thoroughly.

RACINE AUTO TIRE COMPANY

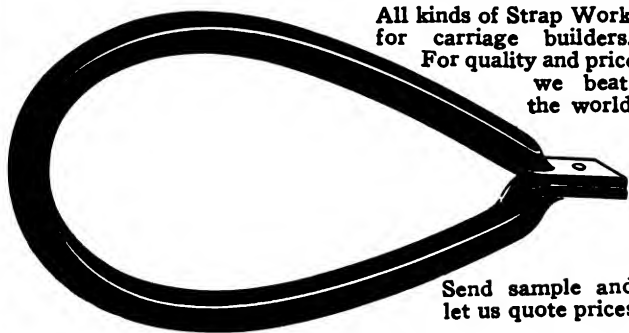
500 14th Street

RACINE, WISCONSIN



AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES

All kinds of Strap Work for carriage builders. For quality and price we beat the world.



J. C. DECKER

Send sample and let us quote prices

Montgomery, Pa.

THE FAIRFIELD RUBBER COMPANY

Manufacturers of

Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.

FAIRFIELD,

CONNECTICUT

LANDERS BROS. CO.

TOLEDO, OHIO

Importers and Manufacturers

BUCKRAM AND WEBBING

Transparent Celluloid, Bow and Stay Lining, Enamelled Muslins, Drills and Ducks, Cotton Sheetings, Burlap, Cushion Canvas, Wadding.

PROMPT SHIPMENTS

LOWEST PRICES

OIL CARPET

OILED DUCK

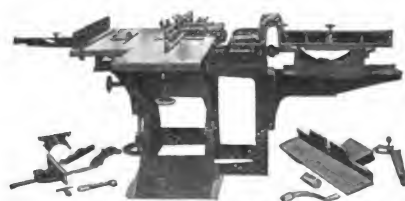
WE MAKE
Rear Dead Axles

for
Motor Trucks
and
Machine Motor
Truck Hubs and
Flanges - - -

FLINT AXLE WORKS
FLINT, MICHIGAN

Manufacturers of
CARRIAGE AXLES

Write For Prices, Mentioning HUB



4-in-1

A Substantially-
Built, All-on-One-
Arbor
Combination

**Jointer, Saw, Boring and Tenoning
Machine**

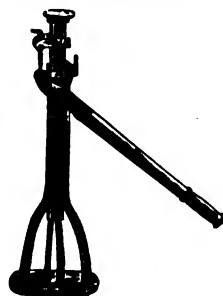
Not too many machines in one—just enough.

Made with either 8 or 12-inch jointer.

Get our complete catalog of handy tools.

BICKNELL MFG. & SUPPLY CO.
JANESVILLE, WIS.

EUREKA WAGON JACKS



Will easily raise a loaded wagon.

Raises any height desired—not
limited to certain heights.

Constructed of steel and malle-
able iron.

Not a bolt, spring, rivet or ratch-
et used.

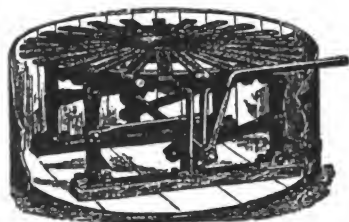
Has nothing to wear out or give
trouble.

Pays dealers good profits. Sev-
eral hundred thousands in use.

Eureka Mower Company

215-225 Schuyler St.,

Utica, N. Y.



The Bokop Tire Setter and Cooler
Is the Best and Only Machine
that has stood the test during
the last 12 years on all classes of
work, and is the Only Machine
built with the Indestructible
Wrought Iron Face Plate.

Over 1,000 are in successful op-
eration, repairs on which have
not exceeded \$6.00 in the last 12
years. For prices, references and
descriptive circulars, address
BOKOP, WEBB & PALM,
Jefferson, Ohio

Richard Eccles Co., Auburn, N.Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile' Special

Send for Catalogue No. 17.

E. SCOTT PAYNE Co.

OF BALTIMORE CITY

**CARRIAGE AND AUTOMOBILE
HARDWARE**

362 and 364 North Gay Street,
BALTIMORE, MD.

PORTER'S BOLT CLIPPERS

"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 Inch.

H. K. PORTER,

EVERETT, MASS.



Patented December 7, 1897.

Bailey Body Hanger

BUGGY and SURREY SIZE

QUICK SHIPMENTS

WRITE FOR PRICES

The Keystone Forging Co.

Northumberland, Pa.

Carriage Mechanics

Desiring to improve their present
Condition should attend the

TECHNICAL SCHOOL

FOR

Carriage Draftsmen and Mechanics

SUPPORTED BY THE

Carriage Builders' National Ass'n.

The object of the School is to teach men to design vehicles and make working drawings, and to otherwise facilitate their work in the shop. Only those men employed in carriage or automobile building or their accessory trades are admitted to its privileges.

The classes are conducted in three divisions, viz.: Corresponding, Day, and Evening. The former is open during the entire year, while the day and evening classes are in session only from October 1st to April 1st.

The tuition is moderate.

For prospectus and full particulars, write to the instructor,

ANDREW F. JOHNSON,

18 West Forty-fourth St.,

NEW YORK CITY.

HOTEL LATHAM

5TH AV. AND 28TH ST.

NEW YORK

For Permanent and Transient Guests

EUROPEAN PLAN

Sample rooms for commercial men

Table d'Hote Luncheon, 50c

CLUB BREAKFAST, ALSO A LA CARTE

ROOMS WITH USE OF BATH, \$1.50 PER DAY

ROOMS WITH BATH, \$2. \$2.50 \$3. \$4. PER DAY

A. L. PRATT

MANAGING DIRECTOR

GEARS

We have Automobile
Gears for every purpose
in stock upon which
we can save you money.

FROST GEAR & MACHINE COMPANY
JACKSON, MICHIGAN



KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

It fills the pores of Metal and Wood perfectly. Sandpapers easily and produces a fine, smooth surface that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

Jones Wheels

BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.

Newark, N. J.

BUSY BUYERS BRIEFS

DELPHOS HOOP COMPANY

MANUFACTURERS OF
HIGH GRADE BUGGY and AUTOMOBILE BOWS

Delphos, Ohio

No Order Too Large Or Too Small Mention HUB

The "CRESCENT" Body Works Reading, Pa.

Builders of High Grade **Auto Bodies** to order
Of Wood or Metal in the White or Finished.

L. M. SMITH & SON Leather

Carriage, Furniture and Automobile
NEWARK, N. J.
59-71 Lock St. 234-236 Central Ave.
Office 59 Lock St.

G. W. MILLIKAN

Manufacturer of
HIGH GRADE BOWS OF ALL KINDS
AUTO BOWS a Specialty.
Muncie, Ind.



CHARLES L. DOWLER

CARRIAGE AND WAGON HARDWARE
108 North Third St., Philadelphia, Pa.

CUSHION MAUFACTURER

Pure Stearic Acid Candles. Wheel Stock. Snow
Flake Axle Grease.

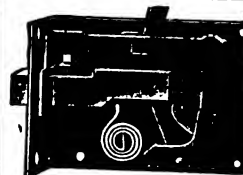
Special Carriage Trimmers Paste GUARANTEED VERMIN PROOF

Get our prices on our No. 38 before
making your 1912 contracts.

BUCKEYE PASTE CO.

COLUMBUS, OHIO The Hub

METAL PARTS FOR MOTOR BODIES
Hammered Work a Specialty
Fenders, Gasoline Tanks, Japanning Ovens
W. G. Burling 1924 Commerce Street,
PHILADELPHIA, PA.



A. Ochsner & Sons COMPANY

1061 State St. N. H. Conn.

Auto and Carriage
Locks, Hinges, Fix-
tures, Etc., and
Bodymakers Tools

Quality, Style, Durability and Quick
Delivery.

The Edward Stinson Mfg. Company VEHICLE WHEELS

327-335 North Street, BALTIMORE, MD.

SCHOFIELD & COMPANY

Manufacturers of

**Schoffeld's Steel
Runner Attachments**

Freeport, Illinois

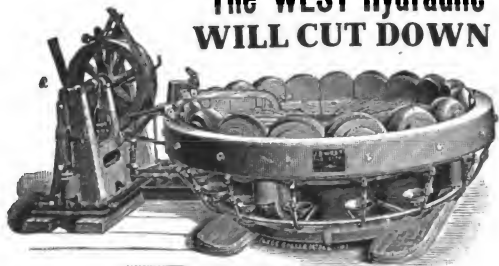
S. R. BAILEY & CO. Inc.

Makers of the Celebrated

Whalebone Road Wagon

AMESBURY, MASS.

The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE

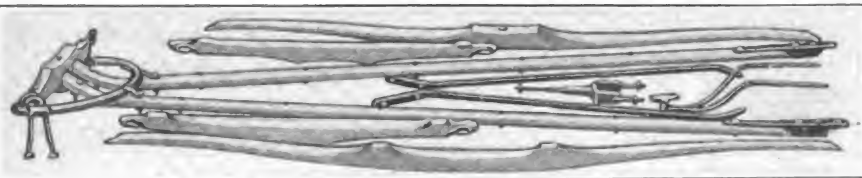
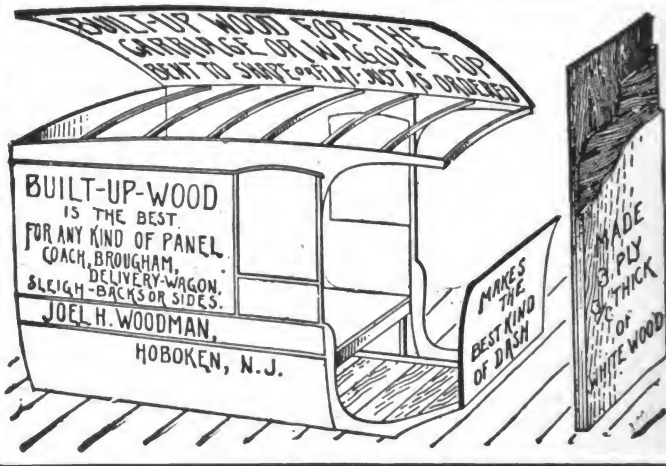


Tires set cold
in one minute.
This machine
saves time —
does the work
better and quick-
er, does away
with burned
streaks. Only
necessary to
measure one
wheel in a lot.
Does not char
the rim and

thus make the tire loosen prematurely. Saves re-sandpapering of
wheels.

This machine is now increasing the profits of many manufactur-
ers. Send for catalog and read about it.

WEST TIRE SETTER CO., ROCHESTER, NEW YORK



The Buckeye Handle Gear & Bending Co.

ALLIANCE, OHIO

Manufacturers of Gear Woods

OUR OLD RELIABLE GEAR SET

The Most Complete Set on the Market. Write for Catalogue and Prices

H. WEICHOLD

L. D. Phone 2290-W Market

METROPOLITAN LAMP COMPANY

Manufacturing and Repairing of

AUTOMOBILE SEARCH and SIDE LIGHTS, COACH and CARRIAGE LAMPS

Makers of All Kinds of Metal Goods.

Nickle and Silver Plating

24 Mechanic St.,

Newark, N. J

Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.

F. O. PIERCE COMPANY

NEW YORK, U. S. A.

Manufacturer of High Class Pigment Colors
from ORIGINAL FORMULAE. Colors ground in
Japan and other MEDIUMS to meet any
SYSTEM of APPLICATION

Our Latest Production UZATONA EXTRA LIGHT for Automobile Painting

Our Automobile Color Book just issued showing latest shades for this class of work
mailed upon application.

MOLLER & SCHUMANN COMPANY

COLORED RUBBING

Most perfect as to working, drying and wearing.

CARRIAGE & AUTO VARNISHES

Send for color card and descriptive price list.

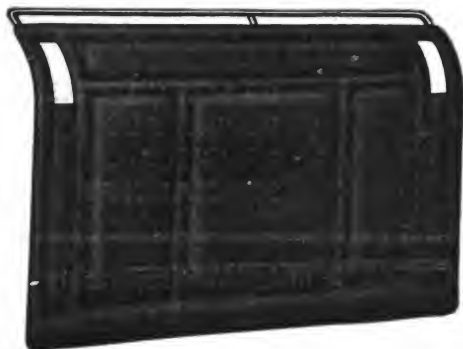
**Office and Factory - BROOKLYN, N. Y. Chicago Branch - 110 N. Desplaines St.,
San Francisco Branch - 1022-1024 Mission St.**

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



No. 263-N with Nickel Rail.

ARE YOU IN LINE

With the Leaders for 1912?

THEY WILL USE DASH RAILS

Welded Solid To The Dash Frame

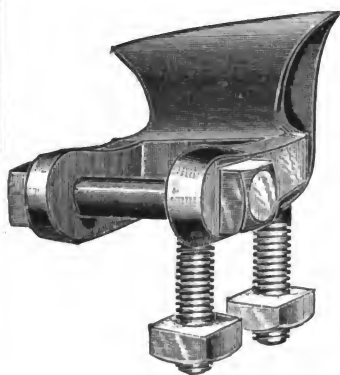
Skewed Shaft Couplings

Regular or Oval Patterns
For High Arched Axles

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



A. H. WIGGERS
Pres. and Mgr.

H. H. WIGGERS
Sec'y and Treas.

E. S. WIGGERS
Vice-Pres.

WIGGERS' BODIES

Automobile - Carriage

MERIT CONSIDERATION



Just One of Many Styles.

Because { THEY HAVE { Style
 { AND ARE { Quality
 { Symmetrical Outlines
 { Well Seasoned
 { Made to Wear
 { Priced Right

Address

THE WIGGERS COMPANY

Manufacturers of Carriage
and Auto Bodies and Seats

1417 to 1423 Plum St.

Cincinnati, Ohio

The Higgin

LINE OF CARRIAGE TRIMMINGS

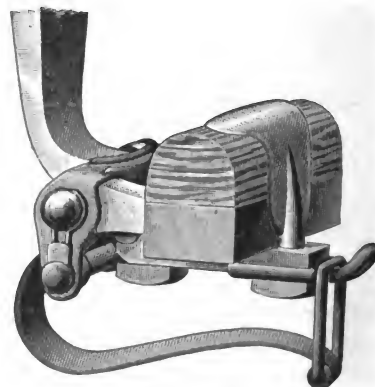
KNOB



No. 70.



No. 133



(Closed.)
The Higgin Quick Shifter.

KNOB



No. 72.



No. 130.



Full Leather Nut



No. 74.



Black Japan Nut

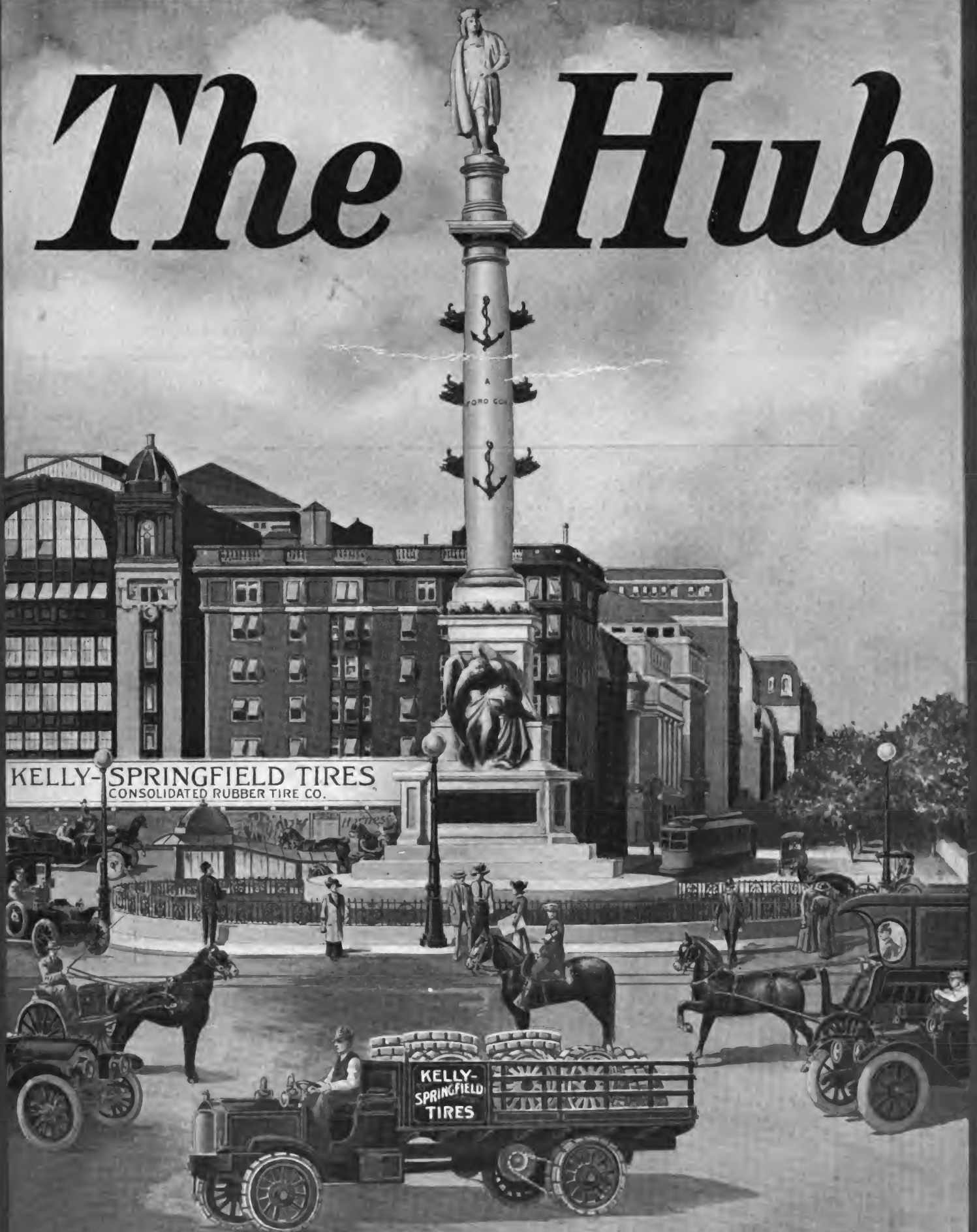
QUALITY UNSURPASSED.

Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co.

Newport, Ky.

The Hub



TRADE NEWS PUBLISHING COMPANY
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN

STAR or KENNY

Sweet Concealed Band

WOOD HUB

WARNER

WHEELS

HEAVY and LIGHT

for

CARRIAGES

WAGONS and

TRUCKS

IF YOU WANT THE BEST TRY OURS

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York,

Chicago,

Minneapolis,

Kansas City



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT.



ACORN.



and STAR



BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO.

RICHMOND, VA.

For Export Prices apply to the New York Office.

For immediate profit and for lasting profit that
always follows satisfied customers,

SELL WAGONS WITH
TIMKEN ROLLER BEARING AXLES

Timken Roller Bearings are adjustable for any and all wear — they last longest and work right as long as they last. Most wagon troubles are axle troubles due to wear. Wagons with Timken Roller Bearing axles are free from axle troubles, they have 50 per cent less draft than ordinary wagons, they enable your customer to cut feed, shoeing, harness and repair bills in two.

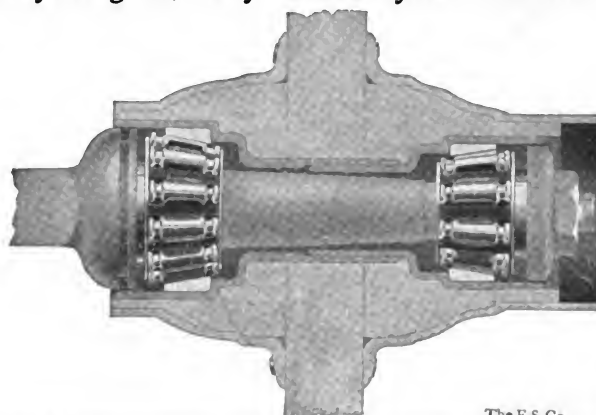
GUARANTEED FOR TWO YEARS
SEND FOR CATALOG AND PRICE LIST

The Timken Roller Bearing Co.,
CANTON, OHIO

note. --We also make Roller Bearings for all Automobile Applications.

note. --Pleasure and Commercial Car Axles with TIMKEN ROLLER BEARINGS furnished by **The Timken-Detroit Axle Co., Detroit, Mich.**

New York Office: 68th and Broadway.
Chicago, 1347 S. Michigan Ave.



The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO

Please mention "The Hub" when you write.



THE CONVENIENCE OF STANDARD UNIVERSAL RIMS

**TWO TURNS
LOCKS IT**

**TWO TURNS
UNLOCKS IT**

PUNCTURES ARE INEVITABLE

NO MATTER what kind of pneumatic tires you use there is always a chance for a puncture. The best of tires will sometimes go flat. That flat tire may occur when touring along a country road at night or while riding through a crowded thoroughfare at mid-day. It's inconvenient and sometimes rather embarrassing to be held up twenty or thirty minutes changing tires. In fact one of the greatest drawbacks to autoing is tire trouble.

Here's a way out—STANDARD UNIVERSAL RIMS. They reduce tire trouble to its minimum, eliminate the wasted time and energy and enable you to change tires in a minute. With ordinary rims it often takes a half hour. And another thing, it doesn't require an expert mechanic or a kit of tools to change tires when equipped with STANDARD UNIVERSAL RIMS. All that is necessary are two normal hands and a small wrench.

STANDARD UNIVERSAL RIMS fit any tire. They incorporate the best features of the Continental, Goodyear, Diamond, (Marsh) and Goodrich Rims, and are made by rim experts, who have had many years' experience in rim building. Their experience and knowledge is welded into a universal type. If you are considering buying a car, it is to your interest that you demand STANDARD UNIVERSAL RIMS. If the car you now have is giving you constant tire trouble, you should look up the UNITED RIM dealer in your town and tell your troubles to him. He'll remedy them very quickly.

We'd like to send you a descriptive leaflet concerning STANDARD UNIVERSAL RIMS. Ask us for information about the rim that two turns locks and two turns unlocks.

A WORD TO THE MANUFACTURER

THERE was a time when the public bought a car chiefly on its appearance and how it rode during the demonstration. But things have changed, cars are no longer bought on their looks alone.

The magazine advertisement has given the buyer some inside pointers on auto making and has taught him to demand the best. Now, before purchasing a car, he asks if it has this kind of an engine, that kind of a magneto and if it is equipped with a certain kind of tires. He also demands that it be equipped with STANDARD UNIVERSAL RIMS. He is rapidly learning the convenience and the many advantages offered by STANDARD UNIVERSAL RIMS.

If you were shown a way by which you could increase the value of your car without increasing the cost of manufacture, you would jump at it, wouldn't you?

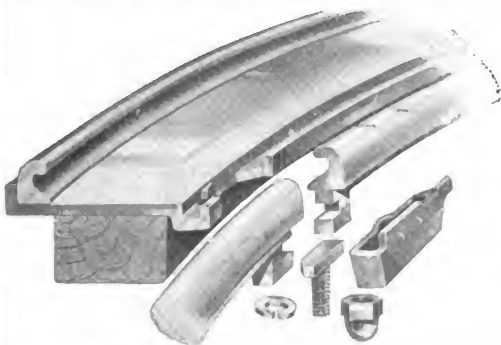
Here's the solution—STANDARD UNIVERSAL RIMS. They benefit the car owner as well as yourself. The fact that your car is equipped with STANDARD UNIVERSAL RIMS can be made one of your strongest selling arguments. We have a proposition that should interest you. Help your agents to sell your 1912 cars by furnishing them another talking point—STANDARD UNIVERSAL RIMS—as part of your regular equipment. We can make shipments of any size rim at once. Write us to-day.

See our exhibit at the
Madison Square Garden, New York City, N. Y.
Exhibit No. 112, Coliseum Annex, Chicago, Ill.
Exhibit No. 532-533, Dept. F., Boston, Mass.

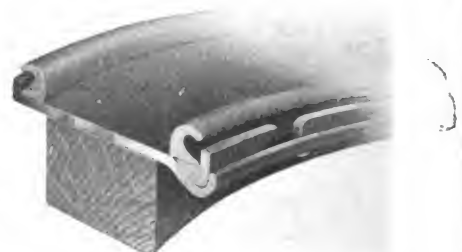
THE UNITED RIM COMPANY

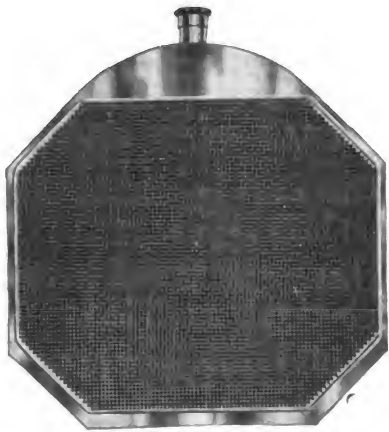
AKRON

OHIO



We also have Type No. 1 and 2
Quick Detachable Rims for all
Clincher and Straight Side Tires,
per these Cross Sections.





MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

¶ Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
NEW HAVEN, CONN.

WILLEY'S COLORS

The **RECOGNIZED STANDARD**



C. A. WILLEY CO.

COLORS GRINDERS

and Manufacturers of Specialties in

CARRIAGE, AUTOMOBILE AND CAR

PAINTS

COLORS, VARNISHES, ETC.

HUNTER'S POINT, NEW YORK CITY

This December

Valentine & Company

is using this space

merely as an

advance agent

to prepare your attention.

The January issue

will give you an

illustration

of a remarkable

demonstration of

Something

Entirely

New

In

Varnish

You will be interested

without a doubt,

especially if you

Build Automobiles.

TRADE **VALENTINE'S** MARK

TRADE MARK FABRIKOID

**An Improvement on Leather
Rapidly Displacing Leather for
Covering Surfaces Exposed
to Hard Service.**

Fabrikoid Leather is a superior quality of artificial leather made by the DuPont Powder Company. Their experience of over a century in producing highest grade products is your assurance of the quality, durability and adaptability of Fabrikoid Leather for the purpose recommended by its makers.

Practical upholsterers, carriage and harness makers, trunk, suit and traveling bag makers, printers and binders, interior decorators, novelty makers—all these have found Fabrikoid Leather a labor saver, an economic material to buy and it has increased their production by reason of its uniformity of width, cutting economies and invariable quality.

Send to-day for Fabrikoid Booklet No. 269 showing sample, colors and prices.

FABRIKOID WORKS, WILMINGTON, DEL.

(E. I. du Pont de Nemours Powder Co., Owner.)



**MERITAS
LEATHER
CLOTH**

The main cause for the exceptional demand on **MERITAS** Leather Cloth is its durability.

It's a low-priced leather substitute you can depend on to give proper service without cracking.

In weights, finishes and colors for all carriage and auto purposes.

Sample book on request.

Ask your jobber for **MERITAS** Leather Cloth if quality counts.

Standard Oil Cloth Co.

320 BROADWAY

NEW YORK

LEATHER

— THAT DON'T CRACK —

That can't be distinguished from machine buffed hide.

That wears as well as expensive leather but costs much less.

Leather with these advantages is **Diefenthaler's** soft and pliable hides, and we guarantee that no oil will come out.

Made specially for carriage and automobile trimmings.

We will send sample hide for your approval without charge.

JOHN V. DIEFENTHALER

Hamilton, Bruen and McWhorter Sts.

NEWARK, - - NEW JERSEY

Hotel Cumberland NEW YORK CITY



Broadway at
54th Street

**A Real Home
Luxurious
Comfortable**

Absolutely Fireproof

Hardwood floors throughout, covered with genuine oriental rugs, is a feature of the Cumberland which indicates the character of the entire establishment. Rare attention to homelike details eliminates the usual hotel atmosphere. Yet there is retained all the charm of hotel life—provision for every want immediately at hand, and at prices within the limits of the average income.

The Cumberland is within

A few steps of surface cars, elevated and subway. Eight minutes' ride of the best shopping districts. Ten minutes' walk of twenty theatres.

"Broadway" cars from Grand Central Depot pass the door.

Rooms with bath, \$2.50 per day, upwards

Write for Booklet To-day.

HARRY P. STIMS, Manager

Please mention "The Hub" when you write.

METAL BODY MACHINERY

of PETTINGELL PATENTS forms the largest, if not the entire equipment of most every automobile body plant in the United States. This surely denotes superiority of the Pettingell line. These machines are also extensively used to do first class work in getting out body stock and frame work.

WRITE FOR CATALOGUE



NEW AUTOMATIC POWER HAMMER

Designed and made especially for Aluminum or Metal Body Work; gives plenty of room to form or turn body panels, seats, wide backs, etc. Is designed and built to run at a high rate of speed, and the peculiar construction with springs and belts preserves the bearings, pins and screws from racking or breaking.



IMPROVED METAL ROLLER FORMER.

A solid, substantial machine, all metal, with cut gears. Will make any curve or various irregular curves on Mud Guards, Metal Panels, Seats, Etc.



HAND MOULDING OR BEADING FORMER.

Will form moulding or beading any size or shape, cuts all metals, will fold in wire around edge of metal and turn over flanges, etc. Intended for use in factories and shops where small machines are needed for much of the work that can be done quicker and easier than on large power machines, and also for many shops where they have not power or facilities or do not wish to put in the large, powerful and more expensive machines.



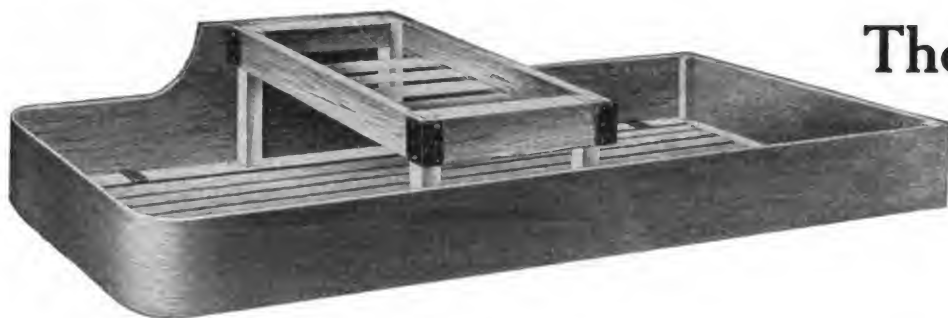
POWER MOULDING OR BEADING FORMER

A big improvement over any machines formerly used for forming, beading or moulding; cutting all metals; turning over flanges or folding in wired edge of metal, or any part of the work, and combines three machines in one. Adjustable every way and quickly changed for any work. Designed and built to handle all kinds of metal, aluminum, sheet steel, copper or tin.

THE PETTINGELL MACHINE CO.
AMESBURY, - - - - - MASSACHUSETTS

Please mention "The Hub" when you write.

Round Corner Buggy Bodies



The Natural Remedy for Most of your Buggy Body Troubles

The above style body can be furnished on any buggy or driver taking 20, 22, or 24-inch wood body.

You wouldn't have much use for a doctor who insisted on prescribing medicine for you without even making an examination of your complaint, would you?

And you'd feel pretty sure he didn't know his business if he were unable to render any assistance after making the diagnosis.

Especially if you were in no way responsible for the thing that ailed you.

Our patients are vehicle dealers and we're the doctors.

A searching investigation of consumers' complaints to dealers about buggy bodies shows that more of them hinge on plugs showing, and corners opening than all others combined.

This style body can be furnished optional at the same prices as the square corners, on any buggy or driver taking 22 or 24-in. steel body.

The dealer has nothing to do with the manufacture of the vehicles he sells.

It's up to us as manufacturers to produce for him the remedy to stop complaints.

We're thoroughly convinced that making the sides and rear panel from a continuous piece of material is the solution.

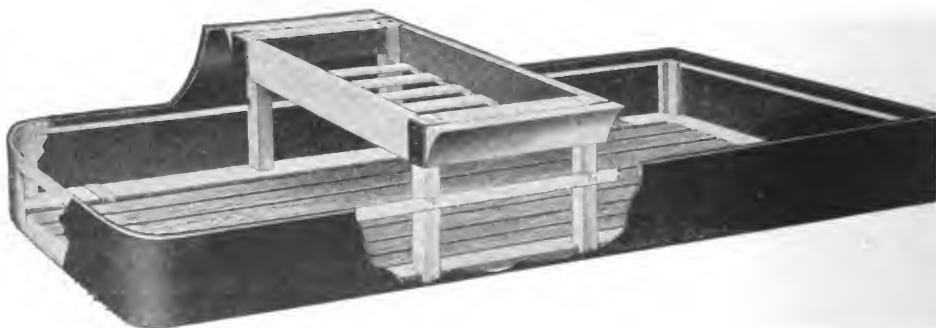
There are no joints to open and no plugs to show.

We've sold the idea to ourselves and will furnish our dealers with wood or steel bodies built according to this plan at the same price as specified in our catalogue for the

ordinary square corners.

Write for full particulars.

Write
for our
New 1912
Catalog



PARRY MFG. CO., Indianapolis, Ind.
The Largest Carriage Factory in the World

Please mention "The Hub" when you write.

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

DECEMBER, 1911.

No. 9.

THE TRADE NEWS PUBLISHING CO. OF N. Y. Nineteen Hundred and Eleven. Publishers of THE HUB

J. H. WRIGHT, *President.* G. A. TANNER, *Secretary and Treasurer.*
24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00

AMERICAN HARNESS AND SADDLERY

DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY.—Gustave Miesen, Bohn & Rh. Subscription price, 12 marks, postpaid.

ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Make Use of a Good Thing.

Commencing with this issue, with a promise of its quarterly repetition, is a "Buyers' Guide."

The object is to present to the trade a handy, easily get-at-able reference of the goods made, their kind and nature, and who is responsible for them.

At present, of course, the list is in its formative stage. It will expand, improve, and become more and more useful as well as complete with time, so we request that criticism be withheld, except in so far as appreciation of its idea goes.

We are receptive to criticism especially as to the "headings" or classifications. Many may have suggestions that will prove of use, and we want them.

This work is not advertising in the accepted definition, rather it is altruistic, trade-wise speaking, because those who are listed are given the publicity without consideration other than their good will, so we hope they will help us to help others by supplying omissions that occur to them as they read the "Guide," thus helping us to help the trade, which is one of the cardinal ideas of service entertained by The Hub.

The finish of this year of grace leaves serious business problems for the new year. We are, for one thing, on the threshold of a "campaign year." By a process of long-continued auto-suggestion the man of business mentally braces himself for a shock at such seasons. The shock is not always forthcoming but the psychological effect never fails in its action.

In one sense there has been a "campaign" on for a couple of years that has been disturbing. Merchants would like to have a reasonable forecast of the future of business which seems impossible until there is had some definite and conclusive determination of the final disposition of the affairs of "big business," the latest euphemistic term for organization in restraint of competition, that we used to call a trust.

The daily volume of business has been fair, there has been a reasonable freedom from failure, and despite legislation that was guaranteed to legislate, price stability through a combination expressed or understood privately, has been maintained at high, and, we suppose, satisfactory levels.

The impressive feature of passing events has been the tendency towards general combination, or corporation. It has become so widespread finally (if finally), infecting the retail merchants of the entire country, who are now officially combined, until we are about to furnish, as a community, the practical working of the oft-repeated joke of the man attempting to lift himself by tugging at the straps of his boots!

The contention by some is that this is a desirable economic situation as it will lead logically to state socialism. Of course, this is stoutly controverted by others.

A deterrent to business well-being has been the constant advance in commodity prices during a term of years, as shown by reliable index figures, while the power to purchase as expressed by wages, has not kept step.

All this has brought about unrest and disturbance that legislation has sought to ameliorate, with what success we don't know, as 1911 has not furnished the key.

The vehicle industry has fared well, especially well in view of the fact that it is one of the few remaining large enterprises that has continued on strictly competitive lines.

There has been a slight decrease in volume of wholesale work, something like 2 per cent in six years (we speak of horse-drawn vehicles). This is negligible and leaves the trade in condition to face the new year hopefully.

The motor-driven vehicle trade has found that the time

has come when there is not so much guilt on the gingerbread as formerly. It sees it must get into its workaday clothes and dispense with the buttonhole bouquet methods of salesmanship that made its advent so picturesque as well as profitable.

Of one thing we may be reasonably assured we think, if we are to judge the future by the past, on so good an authority as Patrick Henry, and that is there always has come a time in price-inflation when natural laws again assumed sway with the object of equalizing forces. If this process is slow and orderly, we have what is termed dull business until the adjustment has run its course, if it is violent we have what is called a crisis—but the result is always invariable, or at least, it has been so far.

We welcome 1912, but we have to acknowledge he is a perfect stranger, and we are not sure how well we will like him.

Good Roads.

The interest in the betterment of vehicle roads is very wide to-day, never has been so wide before. There is official action by states, there is action by organized bodies in many parts of the country, there are congresses, it is altogether noteworthy how widespread is the interest, and how growing. Queer circumstances about it all is that the former is less in evidence than other classes. He would be the greatest beneficiary, but he shows the most conservative spirit.

If plans as proposed, and there are many and of all kinds, are made generally effective, it will not be so long before there will be a wonderful improvement in roads noted. It is a very wise step, from the point of view of self-interest, and we are surprised at the general apathy of the farming class.

Business and Politics.

There will be more business mixed with politics in this next national campaign than can be remembered as having happened during the time of those now on earth. It is usual to talk of politics and business as if they were not interrelated matters. Just a moment's consideration as to what is the true mission of politics will give the promotion of trade as the answer. It has always been so, always will be so, but great numbers never so think of the subject. They say, now that politics are out of the way, we will go back to business, which sentence shows how little the true meaning of politics is sensed.

Without the kindly and fostering care of politics there could never have been protective tariffs, without the latter there could never have been a favored class of merchants, without a favored class desiring still more of the same there would not have been trusts, and without undue greediness on the part of trusts there would have been no restless demand for legal control—by the people who through years voted for the kind of politics that made the conditions possible. What do you suppose will be done about it?

Tipping the Tip.

The traveling men as an organization have gone up against the walls (hotel) of Jerusalem, blown the horn, and the walls must now fall, for is it not written that it is what happened in the long ago?

The salesmen have been counting their small change and they find they are out of pocket some fifty millions a year, due to their lavish generosity in helping to pay the salaries of the hotel servants. They think the 325 millions a year gathered in by the bonifaces is enough for such accommodation and food as they get.

We believe this is incontrovertible, but we fear that there will be backsliders among the commercial agents, and the plan will not go smoothly due to a non-rigid observance of the no-tip rule. This is a human nature proposition, and human nature is peculiar. After all it does not seem such a hardship to let slip a little of the other fellow's money, if your own comfort is being secured.

Pig Iron Prices.

The suit against the Steel Corporation, the reduction in freight on iron rates by railroads owned by the Steel Corporation, and an unsteadiness of quotations, have, all in all, caused the withdrawal of many market orders for the quarter. Foundry iron at the last quoted prices was off about 20 cents for No. 2 grade. Malleable furnace is also quoted lower. This decline in prompt iron prices is largely the effect of sentiment based on the causes above stated.

We don't think the carriage trade will feel any effect of it in prices, as it would have to be a long-continued and maintained reduction to be effective in our trade.

Leather in France.

It is reported in French leather trade centers that prices are high due to increased consumption, and dealers express themselves as believing that the low of a few years ago will never be seen again. We are familiar with such views. They always obtain in periods of price-inflation. The French tanners complain they are losing money on account of the disparity of price of raw material, hides, and price of finished product, leather. This, too, happens everywhere, yet the tanner is a man who seldom fails or goes out of business.

GOOD ROADS.

The roads laid with tar macadam several years ago in Scotland have fulfilled all expectations as regards durability and cleanliness. It is a noticeable fact that the enormous increase in automobile traffic in recent years has told very heavily on such sections of the highways laid with ordinary macadam surface, while the surface of tar-macadam roads remains practically intact.

It has been found that to convert an ordinary macadamized road into a tar-macadamized road it is not sufficient simply to cover the old macadamized surface with the tarred metal. The surface must first be "scarified." When the whole of the original surface has been so "scarified," the tarred metal is laid upon it and rolled in. If the surface is not scarified, but the metal simply laid down upon the old surface of an uneven macadamized road, the finished road soon begins to show unevenness of surface, and finally it is apt to break up at various points.

Vehicle Fashions For December, 1911



NEW AUTO-SEAT SPRING CUTTER.
Ames-Dean Carriage Co.

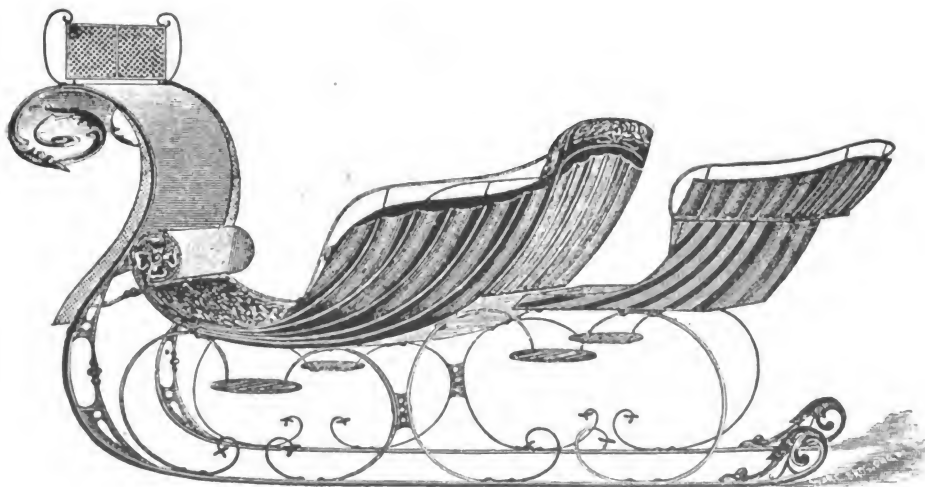


AMES ROUND FRONT SPRING CUTTER.
Ames-Dean Carriage Co.

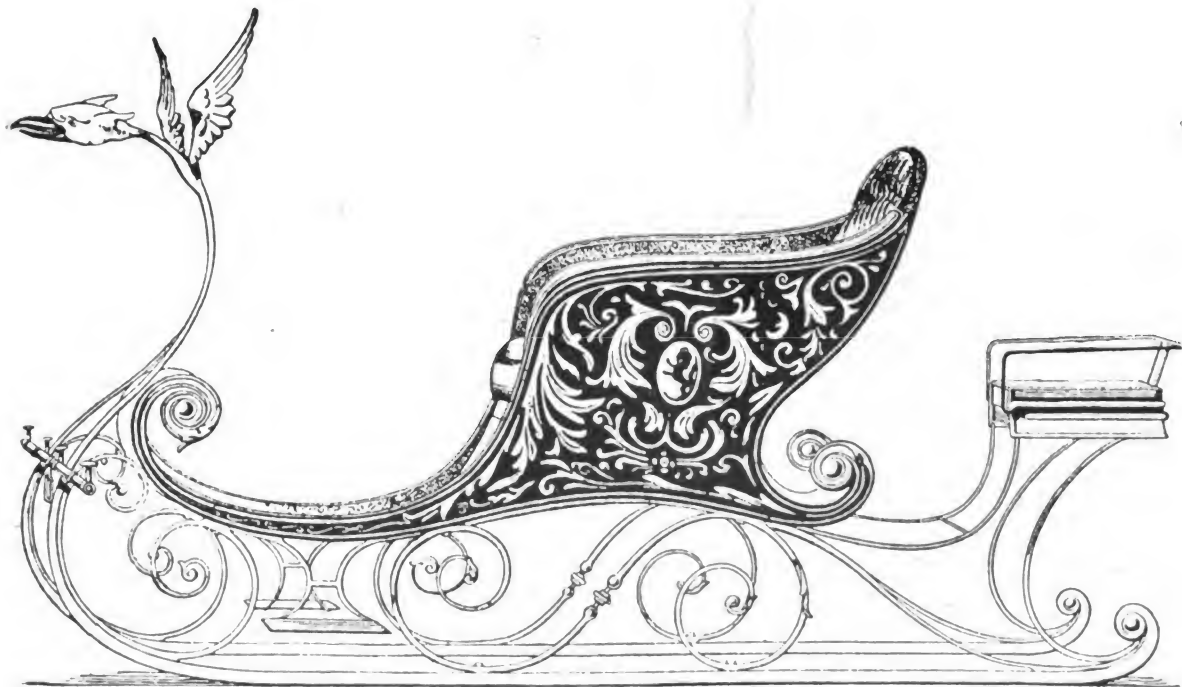
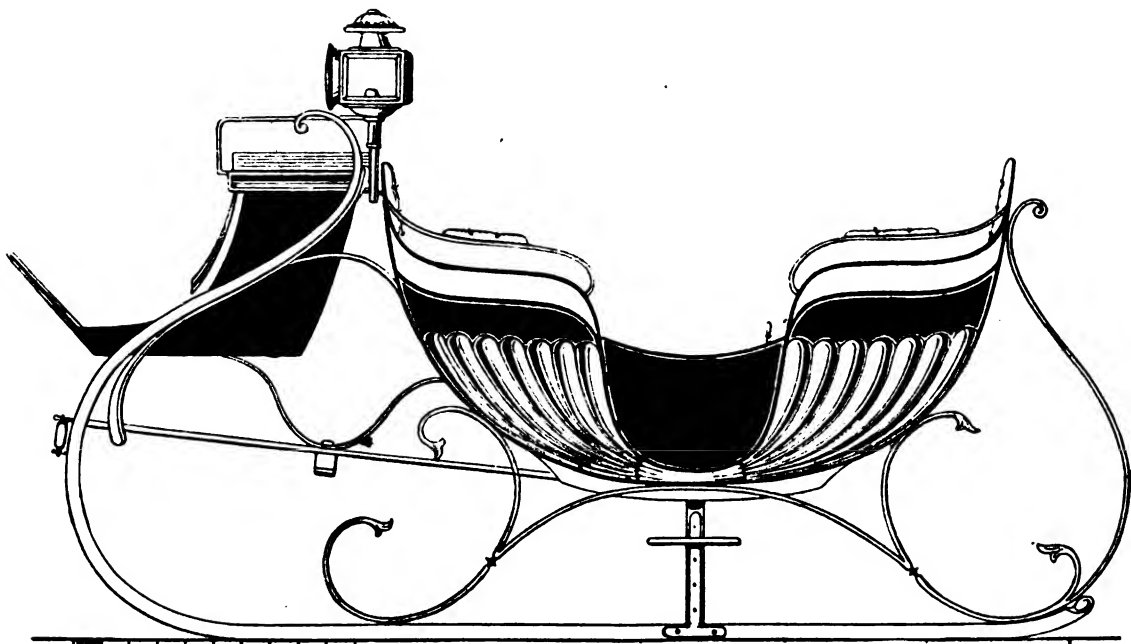
FOREIGN STYLES.



SEDAN SLEIGH.



FOREIGN STYLES.





NEW DESIGN WIDE SEAT TOP SLEIGH.
Sullivan Bros., Rochester, N. Y.



COMFORT TOP CUTTER.
The Sturtevant-Larrabee Co., Binghamton, N. Y.

Wood-working and Smithing

SLEIGH STYLES—FOREIGN AND DOMESTIC.

(Illustrated on Foregoing Pages.)

Sleighs have kept up with the step of progress. They have been built to yield more comfort. They satisfy the requirements. This issue illustrates some Ames-Dean Carriage Co. styles. The "auto" is worked into the design in the form of the seat in the auto-spring cutter, but the real comfort is in the way the cutter body is suspended on its springs. The Round Front Spring Cutter is yet another example. As to construction, material etc., there is no need to go into detail. These sleigh styles are shown to give the idea of what is being built: not how to build. It's a poor body maker who does not possess the knowledge to-day, if he has the model of the style before him.

The covered top cutter shown as an example of the Sullivan Bros.' work is also from a sleigh builder of high repute, whose work is always at concert pitch.

The Sturtevant-Larrabee Co. cutter affords yet another idea of how to get a lot of comfort into a sleigh. The seat is roomy, the protection ample, the lines pleasing.

To contrast this native work we produce foreign styles of sleighs, mainly German, which for elaborateness of iron work, body design, construction, and beauty of outline, are pretty enough. The lines are well worth attention of our own practical builders.

BODY DESIGN IN FOREIGN COUNTRIES.

A "Franklin" Man Recently Returned Gives His Observations.

W. H. Emond, designer for the manufacturers of the Franklin automobile, has just returned from a European trip made for the purpose of studying the development of automobile body design in Germany, France and England. He reports:

"The flush-sided body and the sloping type of hood seem to have the predominance of favor among all European manufacturers, and it is interesting to note the way the various designers are going at it.

"England has led in the development of the flush-sided type and France seems to be the last one in line. This may be due to a small amount of "pique" because the French designers do not like to admit that they are following any others.

"In Germany everything is flush-sided and the Germans are also carrying the matter of the scuttle front to the extreme. One of the most popular types now seen in Germany has a scuttle to both the front and rear seats, the back of the front seat being developed into a scuttle design. Concerning the matter of placing the control levers inside or outside of the body, there is a wide divergence of opinion, but the practice which obtains to the greatest extent is that of putting the shift gear lever inside the body, the emergency brake lever outside.

"It is interesting to note the development of the artistic. The French designers are all for graceful and consistent design with the body lines developed to give the fullest outline and balance of proportion. In England, the whole idea seems to be utility and practicability. The Englishman gets the idea that he wants both levers inside and he puts them there and builds the body around them apparently without consideration as to the effect on the body contour.

"Every once in a while the sloping type of hood crops out unexpectedly from some old-line designer, and even on the water-cooled cars that still put their radiators at the front of the chassis there is a tendency to slope the hood down from the dash to the radiator; in fact, a great many designers think

this sloping type of hood is the only right type and the more fully this type can be carried out the better the appearance of the car."

DRYING AND HANDLING LUMBER.

A whole lot of knowledge has been added to the sum total on the subject of drying lumber within the last few years, though it is safe to say that there is still a good deal to be learned. The seasoning of lumber after it has been received by the consumer and the final process of kiln-drying which precedes its movement to the saws are so important that the treatment of the material should be carefully regulated by the manufacturer, says Chas. D. Gifford, in *The Wood-Worker*.

Sun, wind and the other natural elements do more to season lumber thoroughly than anything else can do, and the time that the lumber is piled in the yard is by no means lost.

When lumbermen sell material to consumers they may guarantee it to be "bone-dry," but taking into account human fallibility, it is always well not to assume that the stock is ready to use, but to give it several months' seasoning in the yard before attempting to make use of it.

The tendency on the part of many consumers has been not to carry large stocks of lumber, but to buy in smaller lots. One effect of this has been that a shorter time has been allowed for the lumber to dry out after it has been received. This is unfortunate, but makes the necessity of careful treatment before the material is cut to dimensions, and preparations made to put it into the work where it is to remain permanently, all the more apparent.

While as an average, it would be better to dry lumber from six to twelve months before using it, this is often not possible. Therefore, the time that it is allowed to remain in the open should be taken advantage of to the fullest extent. Piles should not be more than 6 feet wide, at the most, so that the air will have a chance to get at each board. The individual pieces should not be placed close together, and the layers should be separated by strips.

These strips should be laid close enough together to prevent the boards from sagging. For instance, it was noticed that a consumer of lumber has 12-foot boards piled with only three strips in use, sections 6 feet long therefore being unsupported. This was causing the stock to sag and giving promise of trouble in the future. It was found advisable to take the pile down and put the stock up with four strips instead of three, so that the sections which carried the weight above would consist of only 4 feet instead of 6 feet. A marked benefit followed this change.

Piles should not be placed too close together. Several feet should intervene between them, for not only does this aid in hastening the seasoning process, but is advisable from other standpoints, such as that of fire prevention.

A half-way point between the drykiln and the yard is recommended by some lumber users, however, this being an inclosed shed which is kept at an even temperature of about 70 degrees. Even where no attempt is made to heat the shed artificially, benefit results from the protection from moisture, though this is discounted, in the opinion of others, by reason of the fact that the sun is shut off and less air can circulate than in the case of lumber stacked in the yard. But if lumber can be gradually dried out at a relatively low temperature, it is probably fair to assume that better results will be obtained than if the drying process is too rapid.

It goes without saying that an extremely high temperature in a perfectly dry atmosphere would kill the life out of the best

lumber in the world. If the kiln is kept heated to a temperature of 160 deg., say, the point at which some users of wood maintain their kilns, and the lumber is not pretty thoroughly seasoned when it goes in, the result will certainly be casehardening, imperfect drying and probably checking.

Some users of lumber do not favor the use of a temperature around 160 under any circumstances. They assert that they prefer to take a longer time and have better lumber.

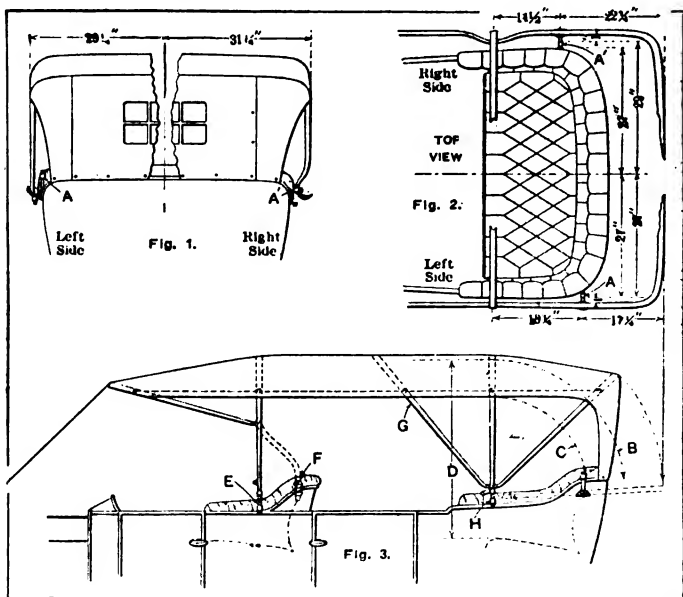
Following the drying process, it has been found an excellent plan to allow the stock to "anneal" for several days before use. Driving the moisture out of lumber causes it to contract, naturally, and it is well to give the lumber time to allow its pores, emptied of their moisture, to gradually expand before cutting it or attempting to work it. The period that the annealing process is permitted to continue varies with the thickness of the material and with the heat to which it has been exposed.

In buying lumber it is usually impossible to get the seller to state the age of the stock. Every lumberman thinks that the seller would willingly part with the information, which would be worth considerable to the user, for he would then be prepared to determine the period that the lumber should remain in the yard and the proper method of handling it in the kiln.

Speaking of drying lumber, it is well to have stacks piled in the yard, with plenty of room underneath. Too many users of lumber put their stock almost on the ground, and under these conditions it is almost impossible to dry the boards on the bottom. It is best, if possible, to place the stacks on concrete foundations, and if these are not practicable, substantial foundations of wood which will lift the pile sufficiently high above the ground to enable plenty of air to circulate and prevent earth damps from permeating the lower sections of the pile.

FITTING CAPE HOODS.

Referring to Fig. 3 of a side elevation of a hood fitting on a fore-door type of car it is pointed out that the iron, if it is placed at E, is in exactly the right position to be struck against by the elbow when the driver slides the gears or puts on the emergency brakes. But if the iron is placed at F instead of at E there is nothing to prevent the proper working of the hood,



and the occupants of the front seat will have a clear view without having to look around an interfering member. Moreover, the idea of interference during the sliding of the gears or the working of the emergency brakes will be done away with.

Still another point that is sometimes overlooked is coupled with the idea that the head room D does not have to be so very much since it is customary to hold to a stooping position dur-

ing the operation of getting into a car, but there is no reason why the diagonal support of the hood should be so slanted as to interfere with the head room at the point G. It is certainly possible to so locate the iron H that the diagonal brace at the point G will come in the plane of the back runners of the rear side entrance.

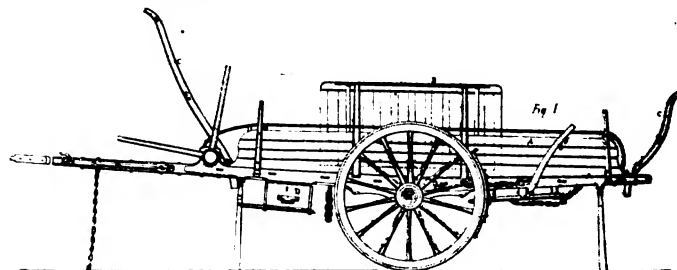
In the three figures given there is ample opportunity to observe the relations as they hold between the side elevation, top and rear view. Success in the fitting of a hood begins with the proper placing of the irons and referring to A and A1 in Fig. 1, the rear top irons are indicated, showing how they are fashioned to support hood when folded down. At A faric is cut away and iron is shown in its position far enough to the back so that socket is level with widest part of seat trimming, measuring about 27 inches from the center line in this example, and referring to A1 at the right side of the body this iron is shown at H in Fig. 3, occupying the forward position, in which the distance from the center is approximately two inches greater than the same distance for the back irons. This increase in distance is due to the placing of the front irons H at the widest part of the body, and it is suggested that the body designer should have in mind the suitable location of the irons at the time of laying out the body.

Proper clearance should be given between the inside of the bow when down and the outside of the socket iron at A1, and experience seems to show that a distance of four inches will be sufficient, making the hood clear at A1. In selecting hoods for the various makes of cars the observance of a due measure of clearance may dictate the use of bent bows in some cases, but it is well to guard against the outward swelling of the bows too much, and here again there is opportunity for the designer of the body to settle the problem of the fitting of the hood, avoiding tight situations, catering to appearance and utility at the same time.

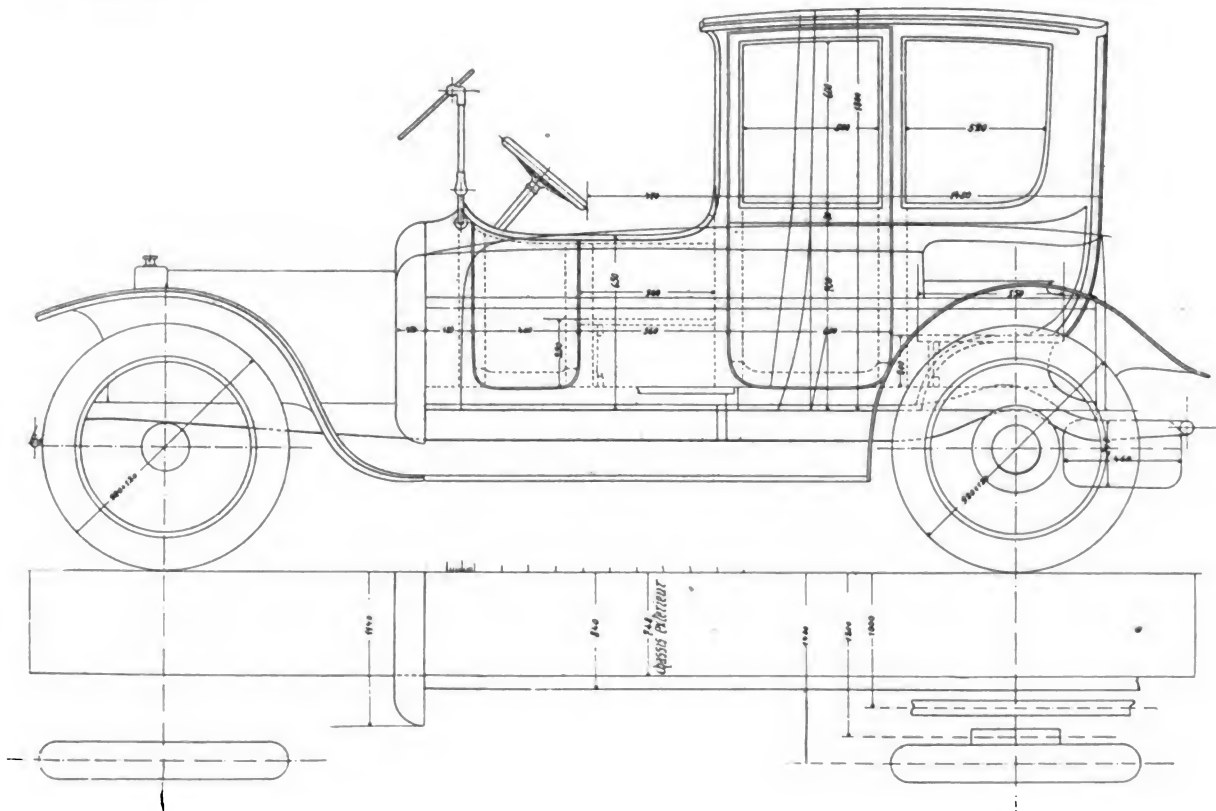
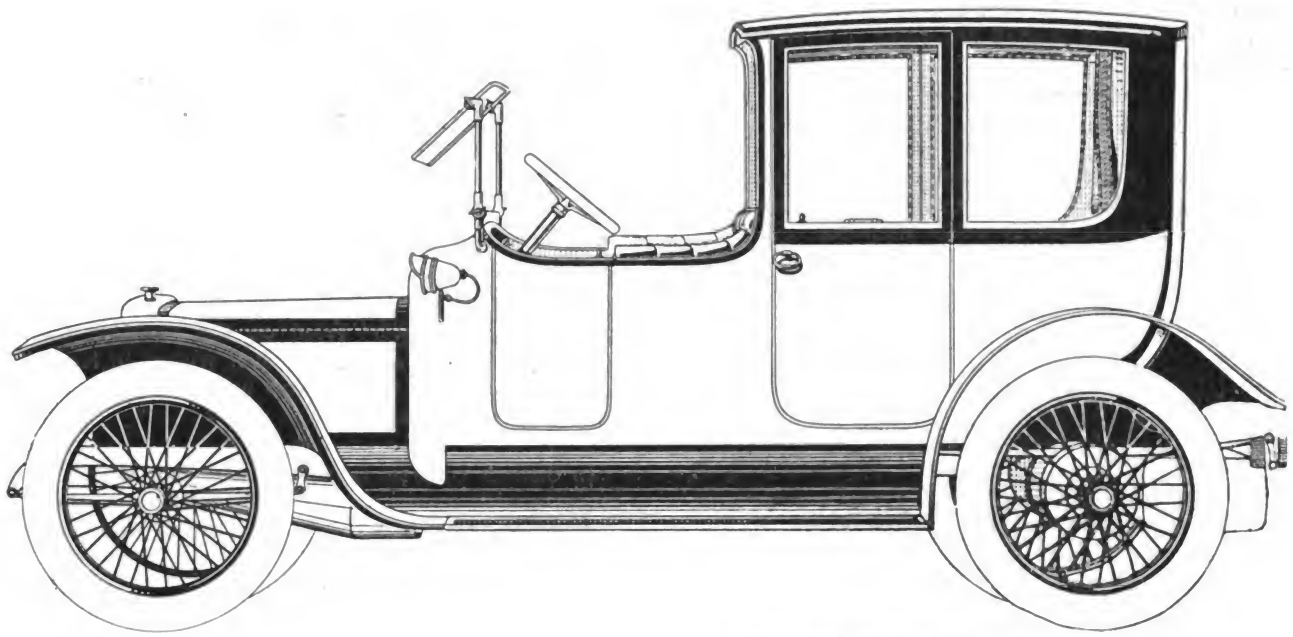
There are two broad considerations that are present in the fitting of hoods, one of which has to do with the hood when it is up and the second point deals with it when it is folded down. Strange to relate, most hoods give trouble when they are in the folded-down position. This is due to the fact that the irons are not placed far enough back to carry the load without putting undue work upon the bows, and this difficulty is accentuated by selecting hoods that are higher than there is any occasion for having them. The illustrations here given show by measurements indicated just what can be done in the matter of fixing clearances and arranging for the proper support of the weight, and if these matters are properly attended to the remaining considerations will have to do with the proper selections of the bows and the fashioning of the irons, having in mind the idea that the irons should be securely bolted to the frame of the body, and for the rest it is a mere matter of picking out a good grade of fabric that will match the outward appearance of the car, keep out the rain and resist dirt.—Cooper's Vehicle Journal.

FRENCH DRAY.

We illustrate as an instance of how it is done elsewhere a French cart designed for heavy loads. This is given only for



the reason that we like to have The Hub as broadly representative of the doings in the vehicle-building world as possible. A true picture must show all the lines.

**COUPE-TORPEDO.**

(Illustrated Above.)

We reproduce from the new French publication *La Carrosserie Automobile* a design for coupe-torpedo, so-called, and the working draft with same, the dimensions being expressed metrically. We also epitomize what that journal has to say about it, hoping it may prove interesting to readers.

It excuses the particular type as being worth while for touring, but lacking elegance for town purposes. The draftsman has done what he could, he says, to modify the faults of the type. He has avoided, where he could, straight lines. He has considered the round-corner treatment of the front of the body, the dash, as more agreeable than the wash-tub roundness usually indulged in. He has allowed for low and deep seats, plenty of leg room, etc. We give the design as a suggestion in lines that are pleasing, because so free from angularity.

NEW RADIATOR.

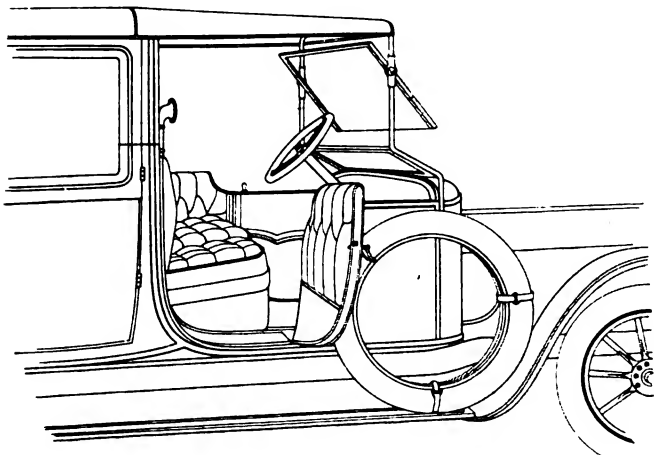
Among the new automobile accessories meeting with considerable success in Paris is a radiator that has been put to practical use by different automobile dealers in Paris and found very satisfactory. It is said to have many advantages over any radiator that has heretofore been manufactured. It is composed of a system of tubes that run horizontally for engines having a pump, and vertically for those equipped with the thermo-siphon. The tubes are 0.4724 inch in diameter and are pierced by smaller tubes 0.2755 inch in diameter. These small tubes are of course open at both ends to permit the air to pass through. The water goes through the larger tubes and runs down over the smaller tubes, thereby cooling very quickly. This system also prevents breaking if the water freezes in the tubes.

The total weight of a radiator for a 12 or 14 horsepower engine is only 28 pounds. Each tube is mounted separately and

in case of an accident can be replaced easily and quickly. They can also be enameled or painted any color to correspond with the color of the car.

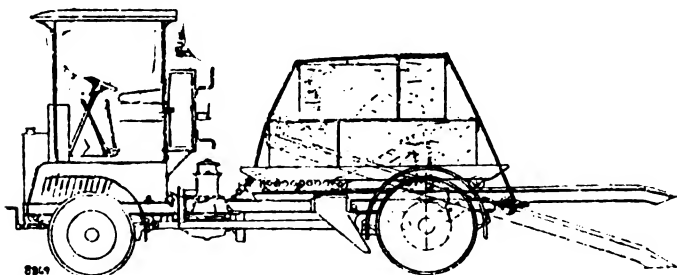
GOOD FORE-DOOR TREATMENT.

The illustration shows a successful means of permitting ingress to the right side of the front seat. It is from the shop of Alfred Alder, London, and is worth attention.



TRUCK FOR HEAVY WORK.

We take an illustration in outline from French sources that shows how problems of heavy loads and draught are being considered. This machine has been specially designed for hauling stone, granite, and other builders' supplies, and is capable of taking an imposed load of five tons at six miles an hour. The body, it should be noticed, rests upon movable rollers, and the platform may be tipped by means of a capstan that is operated



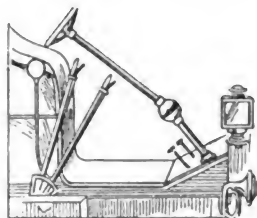
by the engine. By the simple act of releasing a lever, a steel rope which runs over a pulley is also released, and the platform may then be moved backwards and lowered to the ground, together with its load, tipping through a total angle of 20 degrees. The load may be released in two ways; either by moving the truck forward and relying upon the inertia of the imposed load to effect the tipping movement, or by winding the load along by means of the rollers.

EUROPEAN SHOW WILL MOVE.

The European show situation has taken an unexpected turn. A joint meeting of representatives of the French and German automobile manufacturers held last month having agreed to hold but one large "international" show each year on the continent of Europe, the show to alternate between Paris and Berlin. The 1912 show will be held in Paris, under the auspices of the *Chambre Syndicate des Constructeurs d'Automobiles*, aided by the *Automobile Club de France*. This arrangement, of course, does not prevent the smaller countries from holding shows of their own whenever they please, the only parties to this agreement being France and Germany, on whom the burden of exhibiting in other countries chiefly falls.

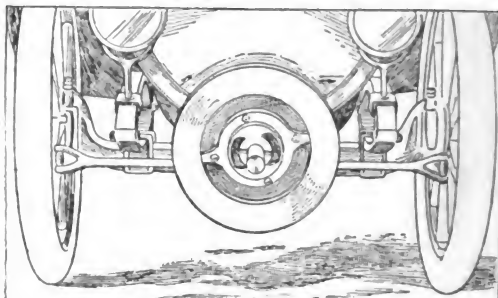
NOVELTIES FROM ABROAD.

Here is a flexible steering wheel of French design. It consists essentially of a universal joint about two-thirds way down the shaft. This joint is enclosed in a spherical hood, which confines the action of the upper part of the shaft to a forward and backward movement, the extent of this movement being limited by stops. Normally the shaft is held in the usual inclined position for steering, both by its own weight and the pressure naturally exerted on the steering wheel by the driver. It is only when the driver wishes to leave the car, or when a sudden jolt might throw him against the wheel that the joint comes into play.



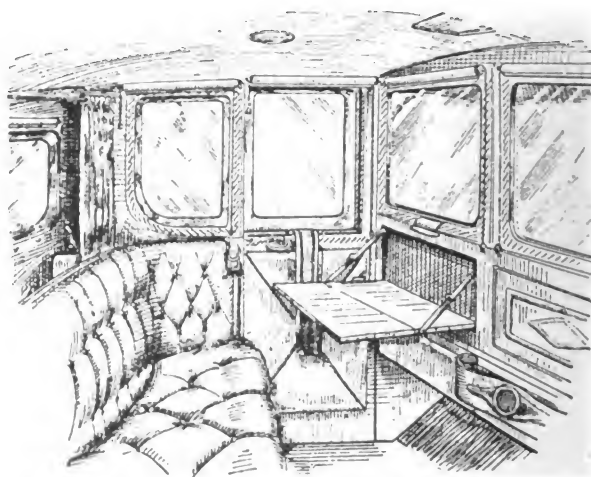
* * *

In distinct contrast to a form of motor which was designed recently with oppositely revolving sections on the theory that gyroscopic action was the direct cause of skidding by automobiles in turning on a wet road, another inventor has sought to achieve the same result apparently by exactly the opposite method. This consists in mounting a heavy gyroscope wheel which is turned directly by the engine and supported in a manner similar to a mariner's compass, in front of the radiator of the automobile. Thus the universally jointed wheel by its own contained energy tends to keep the machine from moving out of a straight line.



* * *

The interior of motor body shown has a rear apartment for the men in livery. It may be seen just back of the rear seat. This is a fine idea of English origin, and should be a wholesome



check on scandalous conversation, as the "below stairs people" would be all too interested auditors. The curtain that is pulled along the rod inclosing the servants from sight, does not prevent their being "to memory dear."

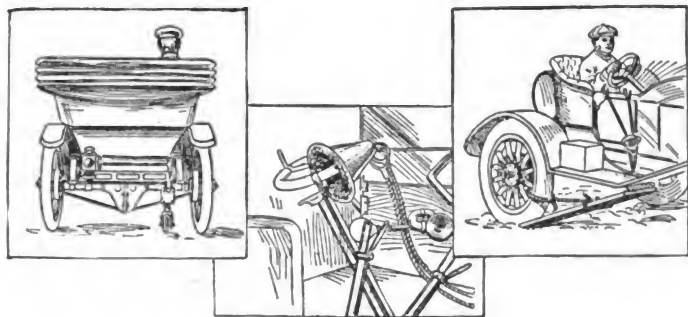
* * *

Three recent ideas for automobiles, consisting of an anti-skid wheel, a traction board for use when stalled in deep sand or mud, and a pair of hot-air gauntlets fastened to the steering wheel, are shown in the accompanying illustrations.

The anti-skid device, which has been taken up by a number of English motorists, consists of a small wheel attached to the

rear axle of the car. This wheel is provided with a flange about $1\frac{1}{4}$ inch wide, and is so designed that it tilts and grips the road with the edge of one of the flanges immediately the car attempts to skid. The wheel is fitted with a rubber tire, which runs evenly on the road when the machine is not attempting to skid. When the roads are dry the wheel may be raised up out of contact with the road surface.

The traction board is a device to assist the car when it has become stalled in sand or slippery mud. It consists of a board track which the wheel draws under itself as it turns. The end of the board is placed in front of the wheel, a chain or rope is run from the metal insert in the center of the board to one of



the lower spokes, or to the tire of the wheel at a point in front and a short distance from the ground. The chain grip automatically disengages itself from the board as the wheel passes over.

The hot-air gauntlets are certainly ingenious, and are designed to fit the steering wheel of the car as shown. The outside coating of the gauntlets is patent leather stretched around a metal form, the interior of which is lined with fur. A pair of flexible tubes inserted at the ends of the gauntlets connect with the exhaust pipe of the car. An adjustable clip is provided so that the hot air can be cut off at any time. It is claimed that an adequate warmth is imparted to the gauntlets within a minute of the starting of the engine.

* * *

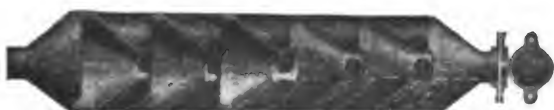
A runabout having several interesting features has been placed on the market in England. The body is of wickerwork, and the front part of the machine presents a striking appearance, a semi-torpedo gasoline tank being mounted above the 8



horsepower twin engine, which is set across the frame well forward. The drive is of a hollow shaft and worm gear. The rear portion of the body, used for storage of luggage while touring, is separate from the seat portion.

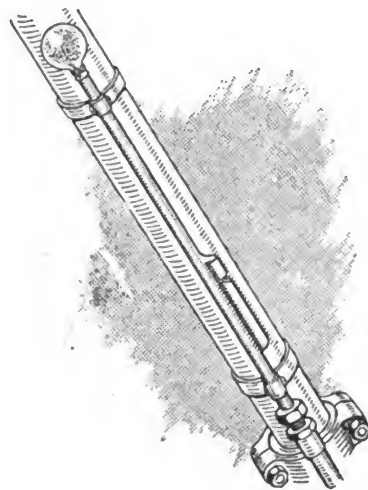
* * *

A new silencer that works with more power and less noise than customary is being introduced in England. The pipe shows



a clear blow through, which diminishes overheating, and the power is not curtailed.

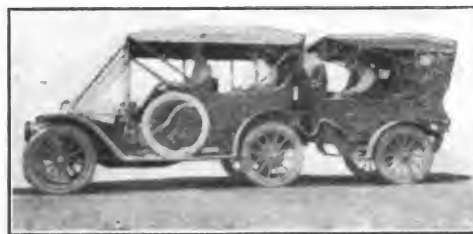
The illustration is an indicator for the lubrication system on a car, and is of English origin. It is a straight tube fitted to the steering column, and leads down to the crankcase, entering



just below the normal level of oil in the sump. If the oil gets below the level, by pressing the bulb shown the whistle that the tube carries is sounded, and the conditions are at once made known without any tiresome investigations.

* * *

The six-wheeled auto stage which runs between Folsom and Sacramento, California, is of local design, being formed by at-



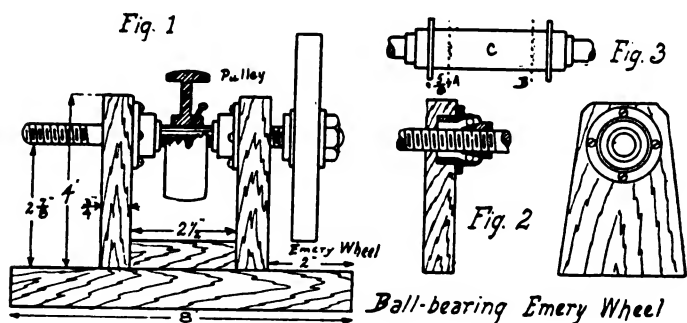
taching an automobile body, with rear wheels in place, to the back of another automobile. The service of this ingenious stage is regular, and it easily maintains a speed of 25 miles an hour.

EMERY GRINDER.

The following illustrations and description is of a satisfactory emery grinder that can be easily made.

First get some good hard wood that will not split easily, and make four pieces of the following dimensions: baseboard, $8 \times 3 \times \frac{3}{4}$ in.; bevel the edges; make two standards $3 \times 4 \times 2 \times \frac{3}{4}$ in., like Fig. 2, make two; strengthener, $2 \times 2 \frac{1}{2} \times \frac{3}{4}$ in.

Next find an old front wheel from a bicycle and take off the hub, with the bearings and cones. Take out the axle and cut



hub with a hacksaw on lines marked A and B in Fig. 3. This will give you two bearing cups to be used in the standards just made. Bore a hole in the standards $3\frac{1}{8}$ in. from the bottom, large enough for the bearing cups to fit in. These holes should not reach quite through. This hole is A in Fig. 2. Bore another:

hole in the center of this hole $\frac{1}{2}$ in. in diameter right through B in Fig. 2.

Next screw the bearing cups to the standards with small screws in the holes formerly used for the spokes on the bicycle wheel.

Now get a steel shaft the same diameter as the axle in the bicycle hub, 7 in long. Thread $3\frac{1}{8}$ in. on each end the same size threads as on the axle.

Next get an old pulley (I used a sewing machine pulley) and fasten it to the shaft in the middle.

Now with the emery wheels and the nuts to hold them on, it is ready to put together. Screw the standards to the baseboard 2 in. from each end and very securely. Put the pulley and cones on the shaft and put it in place on the bearings, placing the balls in the cups first.

If care has been taken to make it strong and true, it will be very serviceable. Mine runs two $5\frac{1}{2}$ in. wheels. The bearings should be kept well oiled. It may be painted and screwed to a bench. Be sure to thread the axle so that the stones will not fly off when running.

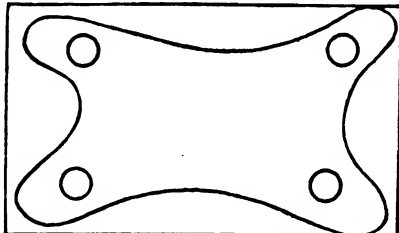
A guide may be made from a few pieces of scrap iron to hold the tools while grinding.

SETTING AN ANVIL.

A point worth knowing, says Horseshoers' Journal, is in how to relieve an anvil from throwing out a tin pan sound or too much noise when being worked on, and also in assisting to keep it perfectly solid on the block by giving it equal bearing on all parts. This is interesting to wagon and carriage smith workers.

Fix a part of a cork on the block about 2 inches away from each corner and let the anvil rest on all four parts. The ordinary cork of about $1\frac{1}{2}$ in. the purpose. It need not in diameter will do for be more than $\frac{1}{4}$ or $\frac{3}{8}$ in. thickness and with nail driven in center the calk is held down to the block.

When, for instance, an anvil is set on a hollow block, the sound is as agreeable as though it was fixed on a solid block, also the noise which some highly wrought anvils throw out becomes reduced in volume when the cork setting is used, and best of all, the anvil never rocks. It is a simple yet valuable idea which every shoer and smith can use with profit.



CARNEGIE'S LIST OF GREAT MEN.

We must have our great men. But every man measures his heroes with his own footrule. Thus Andrew Carnegie's list of great "men who have moved the world" are in large part the Andrew Carnegies that have come before Andrew—his avatars, his previous incarnations. Arkwright, Bessemer, Hargreaves, Kay, Murdock, Mushet, Beaumont Neilson, Siemens, Symington—great cotton men, and iron men, and steel men, and transportation mongers, and so on—movers of the world's machinery.

Meantime, Mr. Carnegie has no thought even for one of the greatest mechanical "movers" the first man who made a wheel—the inventor of the wheel—just the primitive, round, wooden wheel, making possible the first drawn vehicle—moved the world more extensively and profoundly than the inventor of the steam engine or the locomotive. He created civilization. But Mr. Carnegie has no place for the wheel man. Nobody, to be sure, knows who he was—but he was somebody. He was great, but not great enough to be remembered. Perhaps, in a million years, Watt and Stephenson will have shared his fate.

SQUINTS AT OLYMPIA.

The prevailing motor color, as testified by the Olympia show, is pale grey.

The simplicity of the Ford and its low price seemed to be star features.

The Darracq worm-driven, rotary valve, and other details has silence silenced, they say.

Few chasses are so perfect that the last word has been said. The simplicity problem is staring all in the face.

There is a device that connects the tail-light with a buzzer on the switchboard, giving warning that the flame has gone out.

The friction drive is coming to the front for light cars abroad. It is an improvement that seems to have to fight its way to the front.

Think of the expense of a one-piece rear axle, bored out to receive the driving shafts. That's what's found on some of the new Renault cars.

Among those who went with the American auto engineers to the London show was D. G. McDiamond, the superintendent of C. P. Kimball & Co., Chicago.

The London Olympia motor car show comes by the title of the world's motor show fairly. It was actually international in the work shown. Nothing like it on earth, as yet.

They are building motor houses of asbestos sheets, and they are said to answer well the purpose. There is a disposition to drop "garage" for the good Anglo-saxon words.

It seems the coach builder ought to have gone to the Olympia show because it has been dubbed the "Coachbuilders' Show." Luxury of fittings and trimmings were extravagant.

The air-cooled car is still the minority number. It's very difficult for the man of cogs and crotchets to get the viewpoint of something simply good. The idea of air-cooling is making its way, though.

The next jolt will be the self-starting problem, if it is a problem. The first thing that is heard is the word "expense." It seems the makers ought to be willing to let go some of the petit larceny they call profits, and stand a little more expense. The day approaches, probably.

Finally the two-stroke engine is coming into its own. How long it takes the technical mind to consider something easy. An engineer is a man of parts in more than one sense. Here is a hit from The Motor: "If the sleeve valve is to be superseded in turn it will assuredly be by something even simpler. Rotary and piston valves may threaten its supremacy but, obviously, an engine with no valves at all at once solves the problem of simplicity. Such an engine is the two-stroke, and now that some of the difficulties which confronted early workers in this field are being overcome increasing attention must be given to this type of engine."

QUITE A PICTURE GALLERY.

The November Spokesman has worked its camera-box overtime at the Tri-State Dealer's Convention, as page on page of photographs will attest. This is the first time, we think, that the dealer has so numerously appeared in print.

As "imitation is the sincerest form of flattery," we suppose this is Editor Hutchinson's tribute to the initial enterprise of the kind by the Wares at the Carriage convention. It is quite a stunt, and would have been a "headliner" if our Spokesman friends could only have thought of it first.

THE STRUGGLE OF THE VALVES.

Sleeve vs. Contact Hard At It.

Developments in style of design in valves seems to be the leading feature in gas engine construction at present. The sleeve or sliding valve is having it out with the contact or poppet valve. The partizans of both kinds are very staunch in their opinions. The greatest present development will naturally be along these lines. We show some of the most recent sleeve and rotary types.

THE ARGYLL SINGLE SLEEVE.

The principle of the single-sleeve valve Argyll engine is simple, although, perhaps, the actual movements of the ports are not so easily followed on paper. The main point where it differs from other sleeve-valve engines is to be found in the fact that there is only one sleeve having a combination of movements. It is moved up and down, and also has a corresponding reciprocating movement.

Looking at the sectional view it will be seen that the piston is surrounded by a long sleeve, about one-eighth of an inch thick, so ground as to make it a nice running fit for the piston, and at the bottom end of this sleeve, to the right, there is a lug, to which is attached the vertically pivoted pin seen in the illustration, and also a small face block, the latter, however, not being seen in the drawing. At right angles to the pin just referred to will be noticed a spindle which has a bearing in the gearwheel marked A, and beneath this gearwheel will be noticed another marked B, which is driven at engine speed by means of a chain at the forward end of the crankshaft. It will be seen therefore, that the first mentioned wheel is made to revolve as the engine turns, and as it (the wheel) does so, it carries with it the spindle, which may be considered for the moment in exactly the same light as an ordinary crank pin is, in relation to its crankshaft. A better explanation, however, than mere words in reference to this pin, is obtained by referring to the photograph of the different parts of the Argyll sleeve-valve engine mechanism, and in Fig. 7 this spindle and its bearing in the gearwheel are shown; while in Figs. 5 and 6 the cross pinion and the driving pin itself are shown separately. We see that as this gear wheel is revolved, the sleeves must also move, and it does so not only in an up-and-down direction, but also to and fro.

The resultant of these two movements is an ellipse, by which is meant that if one drilled a small hole through the cylinder wall, and held the point of a lead pencil against sleeve, and then turned the engine round through two complete revolutions (i.e., one complete cycle of valve operations) a perfect ellipse would

be found to be traced on the sleeve. Simple as this driving movement is, it lends itself to insure efficiency in the valve operation.

Bear in mind for a moment our simile between the spindle for operating the sleeves and a crank pin. It is common knowledge that a piston moves faster during the center portion of its travel than it does at the ends, due, of course, to the varying vertical velocity of the crank pin itself. But we have said that the spindle is, to all intents and purposes, practically equivalent to a crank pin; therefore, we may deduct the fact that the sleeve also moves faster in the center portion of its travel than at the other end. For the moment we are considering purely the vertical movement of the sleeve. On examining the engine carefully it is seen that the exhaust ports begin to open just when this spindle is in the fastest part of its vertical travel (downwards). Therefore, we have at once what is perhaps the main desideratum for an efficient sleeve valve engine, a quick

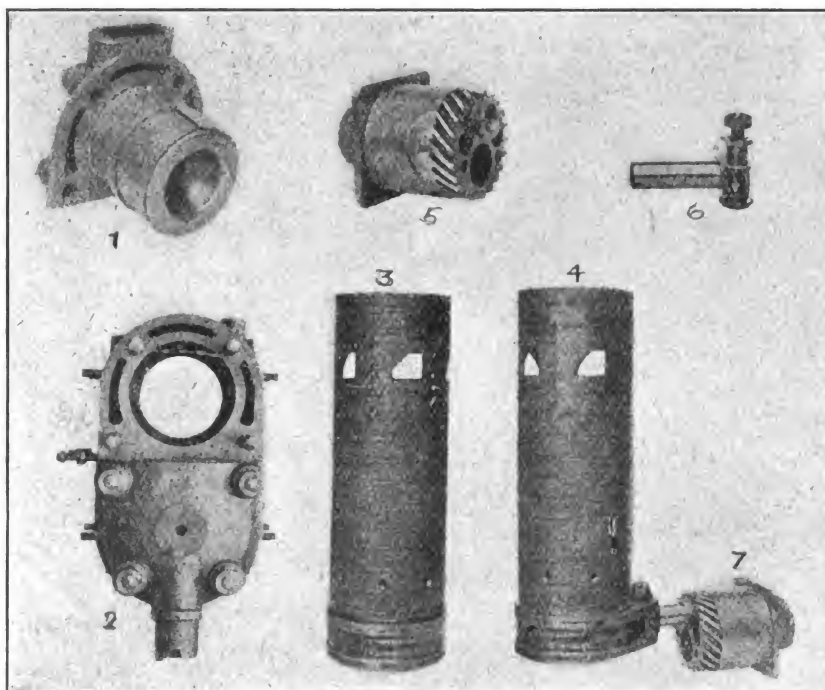
opening of the exhaust valve port. We must not, however, forget the to-and-fro motion of the sleeve, and a little consideration will soon convince us that exactly the same strain of argument obtains here, and the variation of the to-and-fro velocity (we are speaking in simple language) obtains in identically the same way, as in the up-and-down movement. But does this additional fact affect us? Certainly it does, as, in addition to wanting merely a quick opening of the exhaust areas, and, likewise, a sustained opening, we want an equally quick closing, and in this respect the exhaust port is found to be closed by the sleeve when at its highest velocity, but in

this case the spindle is the fastest part of its to-and-fro motion (lower center.)

We now see, then, that the one motion of the sleeve assures us a quick opening and the other motion a quick closing.

But what of the inlet valve? Here, again, an analogous and equally happy state of affairs is found to exist, as the inlet port begins to open just as the spindle is in the fastest part of its to-and-fro travel (lower center), while the inlet port is closed during the fastest part of the up-and-down movement of the spindle; in fact, at this time, the sleeve has almost a purely vertical motion. Herein, then, we have the solution to the quick opening and closing of the inlet ports.

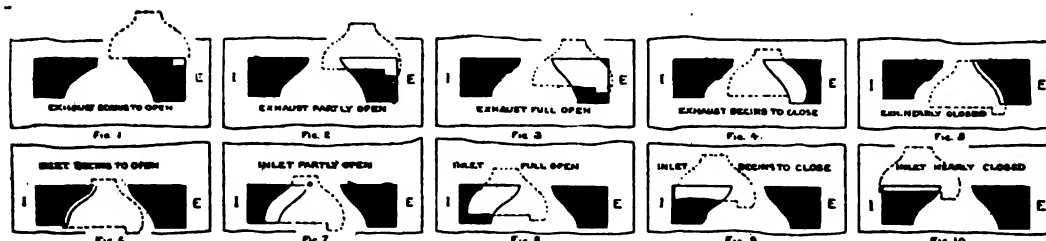
Possibly the observant reader may have noticed that the word "ports" now occurs for the first time, instead of the word "port." The reason is, that there are six ports in the cylinder wall, and five in the sleeve; three of the former for the inlet and



Group of Valve Parts—Argyll Engine.

three for the exhaust. One of the ports in the sleeve does service both for one of the inlet ports and one of the exhaust ports in the cylinder.

We may now refer with advantage to the diagrams which are reproduced. Five different views are shown of the exhaust stroke and also of the inlet stroke, the number selected being purely a matter of convenience. In each diagram the port to the right is the exhaust port in the cylinder wall, and the port to the left

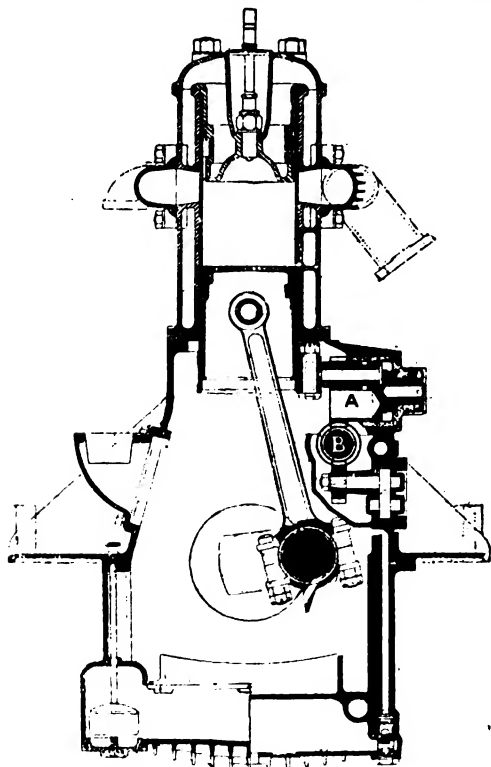


This series of diagrams shows the operation of the duplicated port of the sleeve (which port is the one shown dotted) in relation with one of the inlet ports and one of the exhaust ports in the cylinder wall, the latter ports being marked respectively I and E. The elliptical movement referred to in the text can be traced by following the different positions of the dotted port in the sleeve. In the top row of diagrams it is seen to come downwards and also to move over to the left, while in the lower set, it rises—bearing still to the left—until, after Fig. 10, it goes higher up for the compression and explosion strokes, during which it bears over to the right and comes down again ready to commence once more the cycle as in Fig. 1. The other ports in the cylinder wall are the same as those shown, and the other ports in the sleeve are akin in shape to half of the dotted port, but they are without the little tongue cut in the case of this double purpose port. This little tongue in the duplicated port is designed to give as much lead to the exhaust opening as possible, without interfering with the correct timing of the inlet port. The way in which it just misses interfering with the closing of the inlet port is seen in Fig. 10.

is the inlet port in the cylinder wall, marked, respectively, I and E. The port which is shown partly dotted is the special double purpose port cut in the sleeve to register with the two different ports in the cylinder, as just explained, the diagrams being in relation to the action of the special port.

The other ports in the sleeve and cylinder, which cannot be shown without making the diagram too complex, may be imagined to be akin to the cylinder ports, and to have a movement up and down and to and fro, similar to the one which we are about to describe.

Both the piston and the sleeve travel upwards together until



Sectional View of the New 25 H.P. Argyll Sleeve Valve Engine for 1912.

the explosion takes place, when they likewise begin to come down synchronously. During the explosion stroke all the ports in the sleeve are entirely hidden away from the heat of the explosion, as they travel up behind the extended head with its

large ring. (See the vertical section of the engine.) This is of great consequence. Still another important fact is that the lips of the ports in the sleeve, after the hot exhaust gases have gone by, immediately pass on to a water-cooled portion of the cylinder wall, between the ports, which is probably responsible for the splendid condition which the valve ports have been found to be in after extended tests.

Possibly the theoretical side of the question of vibration may

be a trifle beyond the confines of a description of this sort, but one little fact should be pointed out. Most of us know what effect the dead center has in regard to the piston and connecting rods of an ordinary engine consequently it would be a natural sequence of events to suggest that similar conditions would obtain in regard to the dead center of the sleeve, but, as a matter of fact, there is really no dead center at all, as the construction of the mechanism is such, that when the sleeve is at the top or bottom of its vertical movements, it is, at identically

the same instant of time, at its maximum speed in regard to its to-and-fro motion, so that the two must be taken in combination.

As a final remark on the question of the ports and the valve operations, we would point out the fact that the ports in question are not completely rectangular, but are cut to a duplicated curve, which curve is in no way a whim of the designer, but is one which has only been arrived at after much thought, and also a considerable amount of experimenting. It gives the minimum of clearance while at the same time permitting the maximum port opening, and also a sustained opening, to be followed, in turn, by an equally quick closing of the ports.

The construction of the head is best seen from the sectional drawing. It carries a broad, sunk ring and a narrow piston ring, all rings being prevented from turning. The joint is made with a washer, and there is every facility for free circulation between each head and its cylinder and each pair of cylinders. The upper portion of the cylinder sleeve is very fully cooled, so that the sleeve works under the most favorable conditions.

The lubrication of the engine is very thorough.

THE C. I. D.

This sleeve-valve motor is French, and has attracted a considerable amount of attention by reason of originality of design.

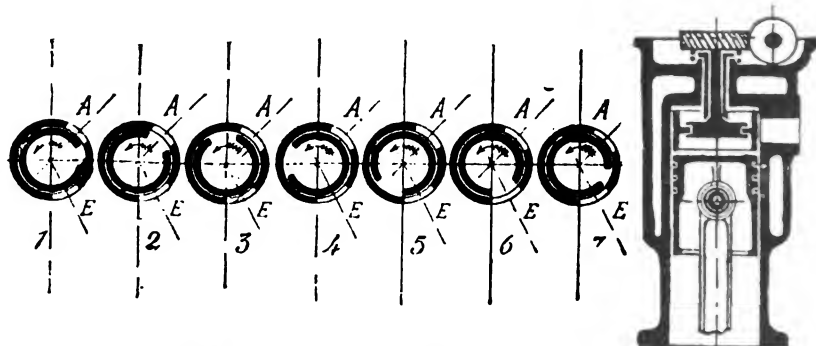


Fig. 1—Diagram showing the different positions of the valve, ensuring the successive phases of a four-cycle motor, and sectional view of the C. I. D. motor.

In the C. I. D., poppet valves are replaced by a rotary sleeve or deep split ring carried in the head of the cylinder and passing across the inlet and exhaust ports in the cylinder walls, which ports are set at about 90 degrees the one to the other. The sleeve is practically of the same nature as a very deep piston ring, but having a considerably greater gap, and it is maintained in contact with the cylinder walls by reason of its ex-

tensibility. Thus the greater the pressure within the cylinder the more the ring is expanded and the less the danger of leakage around the ports. When starting up from cold, or at slow motor speeds, a certain amount of leakage is quite possible, but beyond these very moderate speeds the pressure is sufficient to cause complete expansion of the ring, assuring an absolute gas tight fit. The motor is a four-cylinder monobloc of 75 mm. by 120 mm. bore and stroke, and the design lends itself to a very



Fig 2—The C. I. D. rotary valve with its operating mechanism.

clean cut and accessible engine, having the advantage of silent operation. The rings within the cylinders have to be rotated at half engine speed, in order to fulfill the necessary phases of a four-cycle motor. This movement is attained in the following way. On the center of the left-hand or exhaust side of the motor is a vertical shaft carried within a housing cast with the cylinders, and obtaining its motion by means of worm gearing on the center of the crankshaft.

This position of the vertical shaft is rendered more easy by reason of the absence of a central bearing for the crankshaft, which is carried by the two long, plain bearings. By means of helical gearing this vertical shaft drives a distributor shaft carried on ball bearings within a separate housing bolted to the top of the cylinder bloc. On the distributor shaft are four pinions meshing with the helical gears on the end of the four short spindles driving the sleeves. As will be readily understood, the spindles pass through the head of the cylinders into combustion chamber and by means of a horizontal arm both carry and drive the split sleeve or ring. With the exception of the worm on the camshaft, all the gearing in this motor is contained within the detachable housing bolted to the top of the cylinders, and as no spur or bevel gears are employed, it is easy to understand that the operation is silent.

The method of operation will be thoroughly understood by reference to Fig 1, which is a diagram of the different positions of the valve in order to assure the successive phases of a four-cycle motor. In this, A indicates the intake port and E the exhaust port, while No. 1 shows the intake about to open,

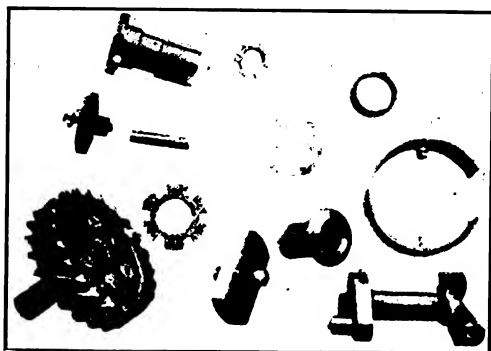


Fig. 3—The rotary valve and its driving mechanism as used on the C. I. D. entirely dismantled.

and No. 7 the exhaust about to close. The sleeve is made to revolve, as already explained, by means of a short vertical spindle passing through the head of the cylinder into the timing gear housing on the top of the cylinders, but the connection is not made direct; that is to say, the spindle is not in one piece from the sleeve to the driving pinion. In Fig. 2 and 3 the valve ring is shown entirely mounted and completely dismantled, and from these illustrations it can be seen that the lower portion of the spindle—the portion passing through the cylinder head—

has two cross arms. The lower one, within the cylinder, has the extremities of its arms grooved in order to receive the sleeve, which is suspended by means of a couple of projecting tongues on its inner face. While this securely holds the ring and allows it to be revolved with the spindle, at the same time it leaves it free for the necessary expansion and contraction to assure gas-tightness. On the other end of the spindle, and outside the combustion chamber, is another cross arm with a projecting stud on its face. When the timing gear housing is removed—this removal carrying with it the horizontal shaft, the magneto and the pinions—these four cross arms with their projecting studs are laid bare. Naturally gas tightness has to be assured around the spindle, and this is secured by means of suitable guides with special cone seatings. The coupling of the sleeve spindle with the driving spindle is obtained by means of a suitable plate having a hole at one end to receive the stud on the cross arm of the sleeve spindle and at the other end a similar hole to receive a stud on the lower face of the pinion. A central pin through the coupling passes into the axis of the upper and lower portion of the spindle. The design makes it possible to take off the aluminum timing gear housing without touching the sleeves and without any difficulty in mounting up again. When the sleeves are in their correct position a mark drawn across one end of the arms forms a continuous line, and it is only necessary to turn the pinions round to such a position

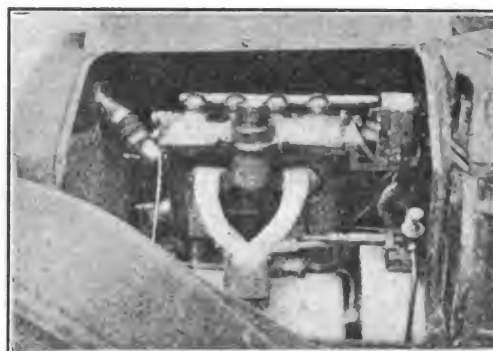


Fig. 4—Exhaust side of the C. I. D. rotary sleeve-valve motor.

that the studs on the pinions will engage the holes in the cross arms for the correct timing to be assured. To obtain a correct balance of these revolving parts—for the sleeves are sometimes running free and sometimes are in close contact with the cylinder walls—the gearing is so arranged that alternate sleeves revolve in opposite directions. Thus, if No. 1 is turning to the left, No. 2 is turning to the right; in other words, the first and third sleeves turn clockwise and the second and fourth anticlockwise. This design of motor allows of the magneto being driven without the use of special gearing. Bolted to the rear end of the timing gear housing is a special platform, to which the magneto is held down by means of a band and a couple of winged nuts.

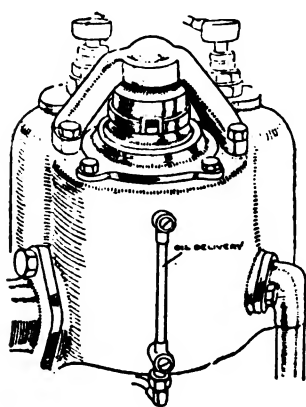
The lubrication of the motor is provided for under pressure without the use of any special gearing for the pump.

THE NEW ITALIA.

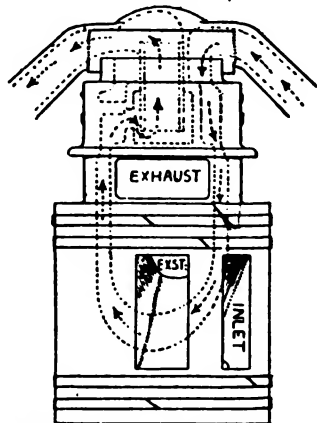
A single distributor valve controls both the inlet and exhaust strokes for one pair of cylinders in the engine of the Italia. In the first place a single pair of rotary distributing valves take the place of the usual set of eight poppet valves in an ordinary four cylinder engine. In addition to the mere fact of the reduction of parts and the simplicity thus attained, silence and lack of vibration at high speed are also desiderata in the minds of the designers. The four cylinders are cast in pairs. Each pair has but one valve, which is revolved in a large cylindrical casing, which casing stands out in symmetrical lines from the main pair-cylinder casting, this valve being in the center between the two cylinders.

Coming to the actual cycle of operations performed by the

rotary valve, it will be seen that it is provided with three sets of rings; two at the bottom of the main valve casting; two at the top and two at the head of the extension piece. The diameter of the cylindrical valve chamber appears to be a little over 4 in., and in the wall of this valve chamber (the valve chamber—not the valve) are two vertical slots some $\frac{3}{4}$ -inch wide and somewhere about 3 inches in length. Each of these two ports is



An external view showing the symmetrical lines of the valve chamber and the oil delivery pipe.

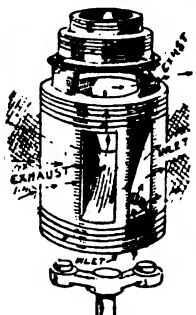


Diagrammatic illustration of the remarkably clever coring for water circulation throughout the distributor valve.

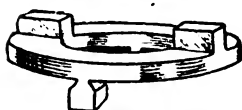
the means through which the inlet charge passes to its respective cylinder, and the exhaust gases escape from the said cylinder. In other words, the ports in the valve chamber communicate direct with the combustion space. In the rotary valve itself, ports to register with the ones just alluded to are cut; the exhaust port being some 30 per cent greater in area than the inlet port.

As will be seen from the illustration the internal portion of the distributor valve casting is peculiarly shaped, as the metal is so arranged as to lead the exhaust from the engine port up to the top of the distributor valve, and then out through a manifold integral with the cylinder casting to the exhaust pipe proper, whereas the inlet comes in from the induction pipe through the base of the valve chamber into the distributor valve and straight through the port of the engine.

A remarkably ingenious coring of distributor valve is effected



An external view of one of the distributor valves, showing the peculiar shape of the metal inside it; also the valve rings.



The brass "safety valve" coupling on the valve spindle with undercut tongues.

so that water passes right through it and round it while it is rotating. The diameter of the valve has been so arranged as to reduce the necessary speed to one quarter of that of the engine (through the duplication of the valve ports in the distributor valve itself), so that every other inlet charge, and every other passage of exhaust gas from a given cylinder comes in contact with a given port in the distributor valve.

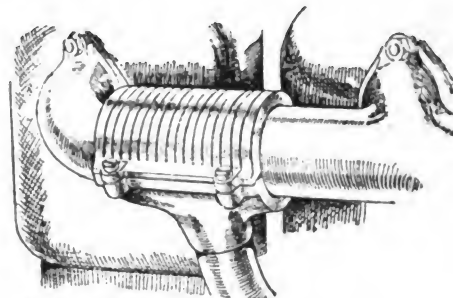
Sketches show the distributor valve and the way in which it is water-cooled.

We may briefly review the cycle of operations, commencing with the exhaust, which in sleeve valve and rotary valve engines, seems to be the more natural sequence. The cylinders follow the general firing order, and we will consider the first pair. Assuming that we are just going to exhaust the charge from cylinder No. 2, the gas passing, as previously explained, through one of

the two exhaust ports in the distributor valve up to the top and out through one of the two spaces in top, then through the internally cast manifold in the cylinder casting to the exhaust pipe. When this piston has finished its exhaust stroke, and therefore reaches the top of its travel, the other piston will just be finishing its firing stroke, and therefore is in turn just

ready to commence exhausting; by this time the exhaust port in the distributor valve has moved round enough to close the port in second cylinder; while the port communicating with the first cylinder is about to be uncovered. It must, however, be distinctly remembered that, although there is only one port in each cylinder, the said port serves first for the incoming explosive charge, and then for the outlet of the exhaust. Therefore, the distance between the two and only ports in the cylinder casting is only large enough to provide a covering on the intervening wall of metal sufficient in width to cover over the exhaust port in the distributor valve, so that as soon as the port in one cylinder closes, the port in the other begins to open, the distance, of course, being worked out to a nicety to provide the correct timing required for the engine. Looking at it the other way round, between the exhaust port and the inlet port in the distributor valve, there is once again an intervening wall of metal sufficient in width adequately to cover the ports in the cylinder, and in this way, as soon as the exhaust port has been closed at the end of the exhaust stroke, it—the same port—is almost immediately re-opened for the inlet gas.

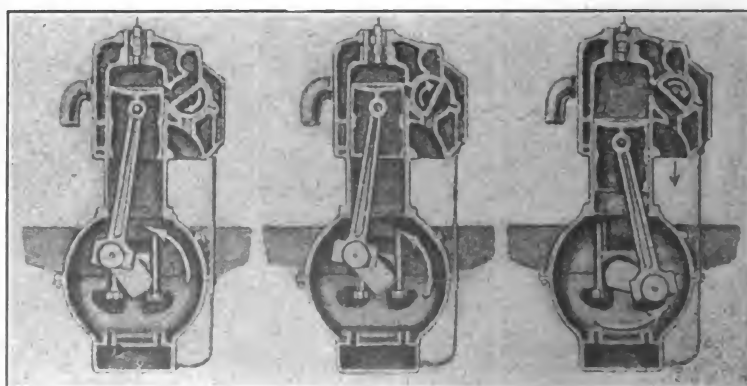
Those at all versed in mechanics would immediately want to know what happens to the thrust of the explosive stroke, in its



The slotted cast aluminum piping around the exhaust pipe for the hot-air intake to the carburetor.

effect upon the rotary valve, that is to say, how is the obvious side thrust of the explosion on the valve dealt with? Here, again, ingenuity and simplicity go hand-in-hand, as right through the diameter of the rotary valve a small hole is drilled, which passes through the water circulation system, and allows the gas to impinge on the far side of the housing of distributor valve, which is slightly recessed for a width of about 2 inches to allow a sufficient area for the back pressure thus intentionally set up, to balance the side thrust of the explosion on the inner side of the distributor valve. Even with all these precautions to ensure the effective operation of this valve, a final provision is made against the possibility of doing serious damage by any chance seizure.

Each of the two rotary valves is driven by a vertical spindle, by the means of two stout pegs, as seen in the illustration. At the base of the spindle under consideration, however, is an Oldham type of coupling made of some description of phosphor bronze, and of the dogs provided on it the two lower ones are tongued or undercut (see illustration), so that if by any chance the valve should happen to seize, or have tendencies in that di-



The Darracq (Henroid) Valveless Engine.

rection, the undercut dogs shear away, and that is the only damage done. To repair the damage at the road side or at home (if near, one could run gently back on two cylinders) is but the matter of a few minutes, as the valve can be lifted up and another coupling introduced. This is purely a precaution in case one should unwittingly run short of oil or in the possible event of something going wrong with the lubrication system.

DARRACQ VALVELESS ENGINE.

The new valveless engine was developed in the Darracq works upon Henriod's patents. The accompanying diagrams are not intended to be more than diagrammatic, while they in no way represent the details of the Darracq design. A D-shaped rotary valve is employed in each cylinder, the valves of the four cylinders being mounted on a single shaft carried horizontally and driven by a vertical shaft and spiral gearing from the crankshaft.

The first illustration shows the commencement of the intake stroke, the flat face of the D-shaped valve giving communication from the induction pipe to the port which admits into the cylinder. The next illustration shows the commencement of the firing stroke, and it will be observed in the first place that the piston covers the whole port, so that the rotary valve is shielded from the greatest heat at the commencement of the firing stroke, and, in the second place, it will be observed that the D-valve has closed all but a very small portion of the valve chamber, so that the expansion of the gases into this small space is negligible.

The third illustration shows the exhaust stroke, the flat portion of the D-shaped rotary valve making the connection from the cylinder port to the exhaust port. Engines built upon this design have been run for some months, and have proved entirely satisfactory, the only trouble so far having been to decide upon the best means of driving the rotary valve shaft, spiral gears being finally chosen.

MR. McCURDY'S SUGGESTIONS.

W. H. McCurdy, president of the Carriage Builders' National Association, asks: "Are the Horse-Drawn Vehicles Increasing or Diminishing in Volume?" and he answers his question as follows:

"The question seems to be uppermost in the mind of the carriage manufacturer to-day and has challenged his attention more or less for the past three years. This query is emphasized more prominently in our industry than in many other lines owing to the fact that some feel that the automobile is taking from us a portion of what we have been educated to believe was our exclusive field of operation, and is now carrying passengers and freight which was formerly the distinct prerogative of the ox, the mule and the horse.

"We reluctantly admit that in the large cities the gasoline and the electric cars have in some measure temporarily displaced the horse-drawn vehicle. This, however, will prove but temporary as there is a close affinity between the trained family horse and its owner that is sure to bring back into use the handsome four-in-hand which but three or four years ago was the pride of our city boulevards.

"Again, I contend that in the small cities and towns and in the country the horse is still the proud claimant of his former rights.

"The farmer who is sane (and when you come in contact with him you will find that he cannot be designated as otherwise) he may buy an automobile when he can afford it, but he does not and will not give up the use of his horses and horse-drawn vehicles. He can afford both, and being aggressive, will keep them both. The farmer and the man who lives in the small town that cannot afford an automobile, or the man who does not want an automobile will continue to keep his buggies, surreys, phaetons, and spring wagons.

"My contention is (and I feel fully justified in it) that the factory grade of horse-drawn vehicles now in use in the small cities and towns and the country has not been greatly disturbed

by the number of automobiles sold; but the falling off of trade, if there be any, may be partially accounted for by the apathy that obtains at present in business generally, but is more directly attributable to a lack on the part of the carriage manufacturer to keep his wares prominently before the world.

"Many have been dazed by the tremendous and unwarranted claims of the automobile manufacturers in the number of automobiles built, and instead of advertising as he did five or eight years ago it is a difficult matter to find an advertisement covering a full page in any of our carriage journals.

"Why this lamentable oversight on the part of the carriage manufacturer?

"Our lack of business foresight in not keeping before the dealer is causing him to run after strange gods. We must hale him, call him back and set him right. Let us resume our old-time aggressive measures and place our vehicles before the dealers through journals that we know get into their hands monthly and I predict that a new era for the buggy manufacturer will soon appear."

THE GLIDDEN TOUR.

The Glidden reliability tour to Florida has ended with a clever victory for the Maxwell entries. Some of the incidents and the conclusions are thus summed up by Duncan Curry:

From a scenic standpoint the route was a beautiful one, unfortunately for the cause of the national highway. The roads are too rough for S. A. tourists to go over them until the highways are in better condition.

That the people of the South are thoroughly aroused over the good roads movement was shown not only by the number of cars they entered on the tour, but by the enthusiasm with which they greeted the tourists at every town or city they passed through.

So far as the contest went, the majority of the amateur drivers had little against the splendid organization and careful driving of the Maxwell trio, who easily won the team contest for the Glidden trophy. This was a remarkable performance, as it was the first time that the Glidden trophy has ever been won by a car costing under \$1,500. They had four cars in the contest with clean scores.

Out of the sixty-four actual starters in the contest only fourteen survived the long and hard 1,460 mile trip without a penalization. They included four Maxwells, three Cadillacs, two Fords, two Stevens-Duryeas, together with a Mitchell, a Flanders and a Columbia car.

While the Maxwell trio were the only ones with clean scores, they were pressed hard by the Stevens-Duryea, Ford and Cadillac teams, and but for the fact that one of the cars on each of these teams was penalized a few points for being late at one of the controls, they would have beaten the Tarrytown trio.

That the contest was no child's play is shown by the fact that two Pierce-Arrow cars and one of the new Packard six-cylinder cars were penalized along with the smaller powered and lower-priced cars. One of the Pierce cars was penalized forty points and the other 1,108 points, resulting in its withdrawal, while the Packard was penalized only 14 points.

The work of the little Flanders and Ford Cars was wonderful. The latter got two cars and the Flanders got one in the clean score division. One of the other Flanders only lost five points. The little Metz cars also did good work, as did the Kelsey three-wheeled motorette, which came all the way under its own power.

While there was some tire trouble there was very little as compared with previous tours. Most of the cars were able to come through with the equipment they carried on their cars. The clean score cars had Morgan & Wright, Ajax, Diamond, Fisk and Goodrich tires.

A cargo of 846 tons of dynamite was recently carried to Panama for canal work by the steamship "Alm."

THREE NATIONAL MOTOR CAR SHOWS.

Practically All Foreign and Domestic Makers Will Exhibit.

Plans completed for the motor car exhibition to be held this midwinter provide for two national shows in New York and one in Chicago. These are the twelfth annual displays made by the industry to show its progress from year to year. The schedule of dates is as follows:

January 6-13—Passenger Car Exhibition Madison Square Garden, New York.

January 15-20—Commercial Vehicle Exhibition, Madison Square Garden, New York.

January 10-17—Combined Passenger and Commercial Car Exhibition, Grand Central Palace, New York.

January 27-February 3—Passenger Car Exhibition, Coliseum and First Regiment Armory, Chicago.

February 5-10—Commercial Vehicle Exhibition, Coliseum and First Regiment Armory, Chicago.

More than two months before the opening date of the first of these national displays, a total of 113 different manufacturers of private passenger cars and 86 makers of commercial vehicles had been allotted space in one or more of them. Sixty-four of these are new exhibitors, having made no displays at the national shows last winter in New York and Chicago. Of the 64, 39 are builders of trucks and delivery wagons and 25 make pleasure cars.

During the two weeks show period in New York more than 100 different makes of passenger cars and 70 makes of work vehicles will be on exhibition simultaneously. In Chicago more than 90 makes of pleasure cars will be shown during the week of January 27 to February 3, and the following week more than 60 different makes of business machines will be exhibited.

Exhibits will include almost every type and size of power vehicle designed for use on the public roads, from motorcycle parcel carriers and delivery wagons of 500 pounds capacity to ponderous trucks of ten tons capacity. Besides the more common types of trucks and wagons, there will be a number of dump trucks for contractors' use, trucks fitted with power winches for hoisting, self-emptying coal and lumber trucks, machines with special bodies for special purposes, self-propelled fire engines and combination chemical and hose wagons, police patrols, ambulances, and other types for municipal and public service purposes.

The two consecutive weeks' display in Madison Square Garden is under the same management that has conducted it for the last seven years. The show committee consists of Messrs. George Pope, Charles Clifton and Alfred Reeves, with M. L. Downs acting as secretary.

The other New York show, which is to be held concurrently with the Garden exhibition, will open on Thursday of the first week and close Wednesday night of the second week of the show at Madison Square Garden. It is to be staged in the new Grand Central Palace. For the first time this exhibition is to be under the auspices of the National Association of Automobile Manufacturers and the management of Mr. S. A. Miles, who has conducted the Chicago show for more than a decade—ever since such shows were inaugurated, in fact.

The Coliseum show in Chicago will be, as usual, under N. A. A. M. auspices and Miles management.

Briefly, the trade situation with regard to the several exhibitions is this: The Garden show is restricted to members of the old Association of Licensed Automobile Manufacturers and makers of electric vehicles who have been consistent exhibitors at Madison Square Garden for the last five years or more. The Grand Central Palace show is "open" to all manufacturers but will not include displays by makers who have exhibits in the Garden. All manufacturers are eligible also for the Chicago show, which is the only one that will be held in that city, and it will include exhibits by most of the makers who display at both the New York shows.

THE PETERS-FIRESTONE MIX-UP.

It Looks as if Firestone Would Have to Share Profits with the Peters Executrix—Long Litigation Nearly Concluded.

The following account is from the Columbus Dispatch of November 17, and will be of especial trade interest, due to a wide knowledge of the parties in interest. Mr. Peters died in an asylum for the insane, or a sanatorium of that character, we have always understood, and the trust deed was given during such occupancy. The extract reads:

Heirs of the late George M. Peters, one of the original owners of the old Columbus Buggy Company, will be greatly benefited by a decision handed down Friday morning by Judge Thomas M. Bigger, of the common pleas court, in the suit filed by Caroline Peters, administratrix of George Peters' estate against Clinton D. Firestone, the principal stock owner in the present buggy company, to construe the meaning of a deed given in 1897, by the deceased, to Mr. Firestone.

The Peters estate maintained that the deed given by Mr. Peters to Mr. Firestone was a deed in trust given for the purpose of effecting a compromise with creditors at the time of the failure of the old buggy company, and that the estate is entitled to one-half of all the assets of the buggy company left after the compromise had been effected. Mr. Firestone maintained that the deed was an absolute one and left no interest in the concern after it had been given. Judge Bigger, in substance, decides that the deed was one of trust.

The old buggy company which was and is now one of the biggest industries in Columbus was formed in June, 1882, by Oscar G. Peters, George M. Peters and Clinton D. Firestone. Mr. Oscar Peters died in 1894 and his interest was divided between the two remaining partners.

On August 1, 1896, the old company made an assignment in the probate court to William A. Miles and John M. Thomas, and on December 16, of the same year, Mr. Peters gave a deed to Mr. Firestone, so the estate contended, in order that the latter might effect a compromise with the company's creditors. On January 17, 1897, a few months later, Mr. Peters died.

On July 27, 1907, the assignment was lifted and the assignees discharged. The estate contended in its petition that the settlement with the creditors was made by Mr. Firestone on a basis which left some assets still in his hands, that he continued the business, and that the estate is entitled to one-half of his profits from that date.

Judge Bigger's decision is with the estate, but just what the practical effect of it will be is problematical, as another proceeding will probably have to be had to determine just what was left and what the estate is entitled to. This will probably be done in master commissioner's proceedings.

ANOTHER NEW YORK CITY SHOW.

Announcement is made of a third motor car show to be held next January. It will be promoted by the Importers' Automobile salon and will be held in the ballroom of the Hotel Astor, January 2 to 10. This exhibition will mark the opening of the show season for the garden show does not open until January 6 and the palace show until January 10. The garden exhibition will last two weeks from January 6 to 20, and the N. A. A. M. show in the palace will run from January 10 to 17. Thus it will be seen that all three exhibitions will run into each other. Practically all of the foreign cars represented in this country will be on view to the public.

ACCEPTS POSITION WITH THE AMES-DEAN CO.

W. G. Farmer, for the past two years with the Emerson Carriage Company, of Rockford, Ill., has accepted a position with the Ames-Dean Carriage Company, of Jackson, Mich. Mr. Farmer has our best wishes for his success.

TEN YEARS' PROGRESS

THE MOTOR CAR OF 1902.

The motor—Engines with one, two and four cylinders. Connected by much piping.
 Separate cylinder castings.
 Small range of flexibility. Efficiency low, owing to a number of causes then unknown.
 Camshafts driven by spur gears.
 Exposed valves. Noisy valve gear. Valves generally too small, and rendered inaccessible by contiguous gear.
 Radiator of gilled tubing with exposed gills.
 Radiator, in many cases, carried below frame and liable to become mud-coated.
 Lubrication—Drip sight-feed lubricators with many pipes, reservoir usually on dash.
 Pressure-feed arrangements liable to become choked.
 Ignition—Coil and accumulator. Tube ignition considered by many as useful for emergencies.
 Carburation—Most uncertain, owing to liability to recondensation. Starting up, very often, difficult. Petrol consumption excessive. Efficiency, therefore, low.
 Clutch—Leather-faced cone, seldom removable without affecting other units.
 Gearbox—Meshing gears. Gear control on a quadrant. Gear-changing on some cars quite an art.
 Transmission—Chain drive to rear axle. Chains liable to become choked with dirt and to stretch.
 Brakes—External band brakes.
 Springing—Not suitable for varying loads or bad roads.
 Accommodation—Usually for four people in cramped and uncomfortable positions. Seating high and exposed. Dust-raising and dust-holding bodies.

THE MOTOR CAR OF 1912.

The Motor—Engines with one, two, four, six and eight cylinders.
 Cylinders cast in sets of two, three or four.
 Great range of flexibility. Greater efficiency with smaller engines.
 Silent chain drive to camshafts.
 Enclosed valves, quite silent in operation.
 Desaxe crankshafts. Sometimes desaxe camshafts.
 Radiator framed honeycomb or gilled tube.
 Concealed gas and water and oil pipes.
 Complete accessibility.
 Lubrication—Pump-circulated lubrication, with single lead to and from small indicator on dash.
 Oil-ways cast through crankcase.
 Ignition—Magneto general. Supplementary ignition on some cars.
 Carburation—Much more reliable and automatically adjusted to engine speeds.
 Self-starters (by compressed air, electric current, or foot pressure) gaining favor.
 Clutch—Leather-faced and metal-to-metal—easily removable.
 Gearbox—Chain-driven gear shafts just introduced. Gears controlled through a gate.
 Transmission—Silent bevel and worm drives to rear axles.
 Brakes—Internal expanding brakes.
 Springing—Well designed for varying conditions.
 Accommodation—For five or seven persons in absolute comfort. Seating low and protected. Flush coachwork. Clever double-purpose bodies.

CLEANING A CAR

This is an owner's job, but the maker is interested that it be done well. We copy from *Motor Age* some ideas it has on the subject.

There is a great difference of opinion as to how the washing of the car should be done, but all authorities agree upon one thing, and that is the plentiful use of clear water as the first step. Clear water will wash off dust, dirt and mud, but it will not touch grease or oil and leaves the car with a dull, dingy, streaked, lustreless appearance. The much too common practice of using gasoline or kerosene is a bad one, as it is very apt to injure the finish of the car. Gasoline will certainly cut the grease and would be very effective if it would only stop there, but it cuts the finish, too.

Most people agree that the proper way of cleaning a car is to use a neutral soap made expressly for washing painted and polished surfaces. Motor car soap has not received until recently the attention it deserves from the soap manufacturers. The advent of the motor car has necessitated the manufacture of a soap especially adapted to the washing of painted and polished surfaces.

It is a neutral soap having those properties that are needed to cleanse thoroughly and at the same time leave a finish in good condition.

In selecting a cleanser for a motor car, most authorities advise the choosing of pure potash and oil soap. It makes little difference whether the soap is soft or hard, although it generally is believed that the hard soaps are more liable to be either semi-potash or soda soaps. Even a pure soap has a dulling effect upon the varnish, while a pure potash soap gives brilliancy and permits a high polish. The soap should be as free

from alkali as is possible, and the presence of excess alkali in an oil soap may be detected by touching the tongue to it. If there is a sharp taste it may be taken that the soap is too strong for motor car use. If it does not contain a small percentage of free alkali it is very liable to contain free fat, which, of course, reduces its value as a cleansing property.

There is a wrong way to use even the right kind of soap. The wrong way is to smear the raw soap over the surface of the car or to work it into a sponge and then dip the sponge into water to make a suds. That way is not economical. It wastes soap, and is apt to leave particles adhering to the surface which will give the car a streaked and smeary appearance and soften the varnish. The right way to use soap on a motor car is to dissolve in a pail of water enough soap to make a good suds and then use that suds for washing purposes. With most kinds of soap, the best method is to dissolve about a handful in a pail of cold or tepid water.

Before applying a suds, rinse the car well with a stiff stream of water from the hose, so as to loosen up all the dust and dirt in order to prevent scratching the surface. This not only loosens the mud which has become hardened, but reduces the probability of scratching the varnish when washing with a sponge. Then, with a clean sponge, apply a heavy suds, especially to those parts which are greasy and oily; rinse off at once with clear water and a fresh sponge and wipe dry with chamois skin or cheese cloth.

It often is found with some soaps that drying with a woolen cloth is preferable to the use of either chamois or cheese cloth, as it sometimes gives a higher lustre. If the gearing, axles and wheels are very oily and greasy, use a heavier suds and more rubbing.

TRADE IN PHILADELPHIA AND VICINITY.**Roving Special Correspondence.**

Philadelphia, Pa., Dec. 1, 1911.

Carriage business is not what it ought to be, there is a dullness prevailing throughout the trade in all its branches. There seems to be a scarcity of money, collections are slow and too long credits are asked for. There has been a fairly good demand for second-hand carriages from the South and the stock is being rapidly depleted here. Cut-unders, rockaways, wagonettes and two-wheel carts are the best sellers around Philadelphia.

Heavy wagons are in pretty good demand. Hubs, spokes and wheels have felt the depression, carriage hardware and other supplies are also quiet, although some firms have been quite busy. Prices are unchanged as to manufactured lines, whether in carriages, wagons or supplies, and the raw materials, lumber, iron and steel, are about the same. Stocks of lumber are easier to secure, such as hickory and oak, although there is no large supply on hand, still the dullness in the trade has kept prices down. There is not much demand for light carriage wheels, the call being for the heavy lines. There is a demand from the South for wheels of the Sarven patent.

Most of the carriage and wagon builders have gone into the automobile body making and are doing considerable business in connection with their old lines.

A fire did considerable damage to the plant of George M. Garrett & Sons, wagon builders at 3908-14 Spring Garden street. The fire started in the finishing department, spread to the varnish and before it was extinguished damaged the plant to the extent of \$25,000. There were over one hundred employees working, but no one was injured. The firm has recently built an addition to the plant on Lancaster avenue and this building was saved. Thirty wagons were destroyed.

The local carriage association has changed its name to the Carriage, Wagon and Motor Vehicle Association, and are debating whether to change the constitution so as to admit to membership the automobile trade. There are now 130 active and associate members.

H. Kaiser & Co., of Twenty-third and Race streets, who do a good business in heavy trucks and delivery wagons, have been busy, have one hundred hands employed and have been working actively the automobile body trade. They are filling orders for four large 3-ton Alco trucks, which have sliding doors and drop gates for the Acme Tea Co. These wagons are for their baking trade and each holds 3,000 loaves of bread; four bodies for the Strawbridge & Clothier auto cars; three auto car bodies for John Wanamaker; fifteen single wagon trucks for the Adams Express Co.; one Lansing truck body for the Merchants' Transfer & Storage Co., of Washington, D. C., About one-third of their work now is in the automobile body line.

The Martin Carriage Works, of York, Pa., has built a 4,000 pound truck for the Buffalo Bill Show, to be used as an advance advertising car, to have gasoline engine and a dynamo to light the car.

Sievers & Erdman, builders of carriages, hearses, ambulances and casket wagons, of Detroit, Mich., were represented at the convention and exhibits of the National Funeral Directors' Association at Atlantic City, by M. J. Cohalan, of Baltimore, Md., their Southern representative, and A. J. Pickett, who travels for them in the West and South. The works are busy, working night and day, and will be enlarged soon. William Heggie, of the firm, was also at Atlantic City.

The old Castor carriage shop, which is an historic site, and was a blacksmith and wheelwright shop since 1854, at Frankford avenue and Overington street, has been sold.

The Lambertville (N. J.) Spoke Manufacturing Co. has been incorporated with a capital stock of \$100,000, by William Keachline, Robert O. Griffith and Edgar T. Phillips.

The Schwartz Wheel Co. will build a two-story factory, 58x95 feet in size, at North and Market streets. Adjoining this will be built a dry kiln building, one story brick, to cost altogether \$10,000.

The Fleetwood (Pa.) Metal Body Co. have put up a new building.

The Rock Falls Manufacturing Co., of Sterling, Ill., were represented at the Funeral Directors' Convention at Atlantic City by C. R. Hardy and Ray W. Hussey.

The Hershey Chocolate Co., of Hershey, Pa., has established a wagon shop. They have 250 horses and mules for their own business.

White Bros., of Wilmington, Del., have remodeled their building and are using the lower floor for a garage and show room, the second floor for carriages, and the third floor for farm implements.

The American Veneer Co., of Kenilworth, N. J., make thirty-five kinds of veneer and are pushing their business in the line of laminated wood for automobile dashboards, fenders, seat bendings and roof panels for limousines, taxicabs and landaulet bodies. William A. Bushfield is the president, treasurer and general manager.

The John Buckley Hub, Spoke and Wheel Co., of 969 North Second street, report their line as quiet now and they are going into the automobile wheel line, and will put in special machinery to make these wheels and put the tires on. They have a yearly capacity of 200,000 heavy spokes, 3,000 heavy hubs and 2,000 sets of wheels.

W. C. Laderer, of Evans City, Pa., has built 1,500 vehicles this year, and 500 sleighs, the latter line having doubled. W. C. Laderer is the superintendent and proprietor; J. M. Laderer, treasurer, and A. E. Laderer in charge of the office.

Sayers & Scoville, of Cincinnati, were represented at the Funeral Directors' convention by their Philadelphia representative, W. S. Bulett. This firm is erecting at their works a new seven-story, reinforced-concrete building for their factory. They are making a new line of high top wagons.

The Philadelphia Bolt Works, Thomas P. Skelly & Co., are so busy that they can hardly fill orders.

The Hoover Wagon Works, of York, Pa., have been building quite a number of mail wagons for use in the Middle West.

The largest truck order that has ever been placed in Philadelphia and what is thought to be the largest single order ever placed in the world, is for fifty Packard motor car trucks, thirty of these being of the three-ton variety and twenty of the one and one-half ton size. This is the third order given by the Acme Tea Co. to the Packard Co.

J. P. Stolzbur, of Elverson, Pa., has bought the retail business and stock of Henry S. Zook, of that place, has enlarged his repository and has also gone into the automobile line.

J. J. Shannon & Co., 1744 Market street, have taken up a new line, in handling the Auburn Wagon Co.'s drop-bottom dump wagons, made at Martinsburg, W. Va.

The Martinsburg (Pa.) Vehicle Co. has built a new three-story brick and stone fireproof building for their works.

Norman B. Slack, an implement dealer of West Chester, Pa., has gone into the line of handling and repairing of automobiles and harness.

The Eagle Wagon Works have made a change in their representation here. W. H. Bradt, 714 South Broad street, succeeds Joseph Craven of 223 North Broad street. H. H. McCargo, who was a salesman for the Studebaker Co., will sell the Eagle line of drop-bottom and coal wagons.

J. J. Shannon & Co. are handling a new stone spreader wagon, which the driver, by the turn of a lever, spreads rock along a road, the width of the wagon.

The Sheldon Axle Co., of Wilkes-Barre, Pa., has built an addition to its plant and increased the capacity.

Cotterpins rubbed with flake graphite will not rust and can be easily removed.

Carriage and Automobile Accessory Trades

BUYERS' GUIDE

The Hub Carriage and Automobile
Accessory Directory. Issued Quarterly.

VOL. 1 **DECEMBER, 1911** NO. 1

*A classified list of articles used by the Trade, arranged alphabetically,
with names of makers in alphabetical order under
the respective headings.*

A COMPLIMENTARY SERVICE TO THE TRADE

ALUMALOYD SHEETS.

Alumaloyd Products Co., Canton, O.

ANTI-RATTLERS AND QUICK-SHIFTERS

(See Couplings)

ANVILS

Columbus (O.) Anvil & Forging Co.
Columbus (O.) Forge & Iron Co.
Eagle Anvil Wks., Trenton, N.J.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Potts & Co., H. T., Philadelphia
Wiebusch & Hilger, New York
Wright & Sons, P., New York

AUTOMOBILES

Babcock, H. H. Co., Watertown, N. Y.

Bailey, S. R. & Co., (electric) Amesbury, Mass.

Bowling Green Motor Car Co., Bowling Green, O.

Cartercar Company, Pontiac, Mich.

Chase Motor Truck Co., Syracuse, N. Y.

Clarke-Carter Automobile Co., Jackson, Mich.

Columbus (O.) Buggy Company

Corbitt Automobile Co., Henderson, N. C.

Crow Motor Car Co., Elkhart, Ind.

Duryea, Charles E., Saginaw, Mich.

Haberer & Co., Cincinnati, O.

Imperial Automobile Co., Jackson, Mich.

Inter-State Automobile Co., Muncie, Ind.

McIntyre Co., W. H., Auburn, Ind.

Martin Carriage Works, York, Pa.

Metzger Motor Car Co., Detroit, Mich.

Middletown Buggy Co., Middletown, O.

Moyer, H. A., Syracuse, N. Y.

Ohio Motor Car Co., Cincinnati, Ohio

Paterson Co., W.A., Flint, Mich.

Pilot Motor Car Co., Richmond, Ind.

Pullman Motor Car Co., York, Pa.

Regal Motor Car Co., Detroit, Mich.

Schacht Motor Co., Cincinnati, Ohio

Studebaker Corporation, South Bend, Ind.

Warren Motor Car Co., Detroit, Mich.

White Co., The, Cleveland, O.

AUTO BODIES

See Bodies and Seats.

AUTO BODIES AND BODY PARTS

See Bodies and Seats for Carriages, Wagons and Automobiles.

AUTO DASHES, FENDERS, RAILS, ETC.

See Dashes, Fenders, Rails, etc. for Carriages, Wagons and Automobiles.

AUTO FABRICS

Laidlaw, Wm. R., Jr., New York
Muttly Co., L. J., Boston, Mass.
Parry & Co., A. N., Amesbury, Mass.

AUTO FORGINGS

See Carriage, Wagon and Automobile Forgings

AUTO HARDWARE

See Carriage, Wagon and Automobile Hardware.

AUTO LEATHER, PATENT AND ENAMELED.

See Leather, Patent and Enameled, for Carriages, Wagons and Automobiles.

AUTO MOUNTINGS AND LAMPS.

See Mountings, and Lamps for Carriages, Wagons and Automobiles.

AUTO OIL CLOTH.

See Oil Cloth for Carriages, Wagons and Automobiles.

AUTOMOBILE PARTS

American Distributing Co., Jackson, Mich.
Baker, W. C., Amesbury, Mass.
Bretz Co., J. S., New York City
Bridgeport (Conn.) Brass Co.
Brunner Mfg. Co., Utica, N. Y.
Carey & Co., Philadelphia, Pa.
Cleveland (O.) Hardware Co.
Flint (Mich.) Axle Works
Frost Gear & Machine Co., Jackson, Mich.
Gaylord Co., The F. L., Ansonia, Conn.
Gilbert Mfg. Co., New Haven, Conn.
Hoadley, F. B., Waterbury, Conn.
Hoyt Electrical Instrument Works, Penacook, N. H.
Lewis Spring & Axle Co., Jackson, Mich.
Morse, Frank W., Boston, Mass.
Muncie Gear Works, Muncie, Ind.
National Brass Mfg. Co., Rochester, N. Y.
Ochsner & Sons Co., A., New Haven, Conn.
Philadelphia (Pa.) Timer & Mach. Co.
Phosphor Bronze Smelting Co., The, Philadelphia, Pa.
Powell Muffler & Timer Co., Utica, N. Y.
Smith & Co., Jos. N., Detroit, Mich.
Sparks-Withington Co., Jackson, Mich.
Union (N.Y.) Forging Co.
Willet Engine & Carburetor Co., Buffalo, N. Y.

AUTO RUBBER TIRES

(See Rubber Tires)

AUTO SPRINGS, GEARS, ETC.

See Springs, and Gears for Carriages, Wagons and Automobiles.

AUTO TOPS

See Tops and Top Parts for Carriages, Wagons and Automobiles.

AUTO TRIMMING MATERIALS

See Trimming Materials for Carriages, Wagons and Automobiles.

AUTO WHEELS

See Wheels for Carriages, Wagons and Automobiles.

AXLES, ETC.

(Including Cone, Ball and Roller Bearing.)
For Carriages, Wagons and Automobiles.

Aden Mfg. Co., Danville, Va.
American Ball Bearing Co., Cleveland, O.
Ansted Spring & Axle Co., Connersville, Ind.
Automatic Axle Co., Lancaster, Pa. (Cone and Ball Bearings)
Bower Roller Bearing Co., Detroit, Mich.
Cincinnati & Hammond Spring Co., Cincinnati, O.
Cleveland Axle Mfg. Co., Canton, O.
Concord Axle Co., Penacook, N. H.

Flint (Mich.) Axle Works
Frost Gear & Machine Co., Jackson, Mich.
Gardner Axle and Machine Co., E. J., Carlisle, Pa.
Hess-Pontiac Spring & Axle Co., Pontiac, Mich.
Hess Spring & Axle Co., Carthage, O.
Higgins Spring & Axle Co., Racine, Wis.
Houston-Hay Axle Co., Coshocton, O.
Illinois Iron & Bolt Co., Carpenterville, Ill.
Kalamazoo Spring & Axle Co., Kalamazoo, Mich.
Lewis Spring & Axle Co., Jackson, Mich.
Liggett Spring & Axle Co., Pittsburg, Pa.
Makutchan Roller Bearing Co., Chicago, Ill.
Mott Wheel Works, The, Utica, N. Y.
Salisbury Wheel & Mfg. Co., Jamestown, N. Y.
Scranton (Pa.) Axle and Spring Co.
Sheldon Axle Co., Wilkes-Barre, Pa.
Spears Axle Co., Wheeling, W. Va.
Timken-Detroit Axle Co., Detroit, Mich.
Timken Roller Bearing Co., Canton, O.
Weston-Mott Co., Flint, Mich.
Western Spring & Axle Co., Cincinnati, O.
Wurster & Co., F. W., Brooklyn, N. Y.

BALL BEARINGS

American Ball Bearing Co., Cleveland, O.
Bretz & Co., J. S., New York City.
Standard Roller Bearing Co., Philadelphia, Pa.

**BATTERIES
For Electric Vehicles**

Edison Storage Battery Co., Orange, N. J.
Electric Storage Battery Co., Philadelphia, Pa.

**BENDINGS
Pipe**

National Pipe Bending Co., The, New Haven, Conn.

BENT WORK

See Woodstock.

BEVEL MITRE CALCULATOR

Powell, J. B., Philadelphia, Pa.

BLOWERS

Buffalo (N.Y.) Forge Co.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Champion Blower & Forge Co., Lancaster, Pa.
Electric Blower Co., Boston.
Roots, P. H. & F. M. Co., Connersville, Ind.
Silver Mfg. Co., Salem, O.

**BODIES, SEATS, ETC.
Wood and Metal.**

For Carriages, Wagons and Automobiles.

Ahr & Rost Co., Cincinnati, O.
American Body Co., The, Buffalo, N. Y.
Amesbury (Mass.) Metal Body Co.
Auto Body Co., Lansing, Mich.
Auto Parts Co., Chicago, Ill.
Bailey & Co., S. E., Lancaster, Pa.
Biddle & Smart Co., The, Amesbury, Mass.
Biel's Carriage and Wagon Works, Reading, Pa.
Blue Ribbon Auto and Carriage Co., Bridgeport, Conn.
Brown Auto-Carriage Co., The, Buckeye Carriage Body Co., Bellefontaine, O.
Burling, W. G., Philadelphia, Pa.
Carriage Woodstock Co., Owensboro, Ky.
Central Mfg. Co., Connersville, Ind.
Cincinnati Panel Co., Cincinnati, O.

City Carriage Factory, Red Bank, N. J.
Collins Carriage Co., Camden, N. J.
Collins Vehicle Woodwork Co., R. N., St. Louis, Mo.
Crescent Body Works, Reading, Pa.
Dann Bros. & Co., New Haven, Conn.
Dunham & Son, D. B., Rahway, N. J.
Durant-Dort Cge. Co., Flint, Mich.
Excelsior Seat Co., The, Columbus, O.
Fleetwood (Pa.) Metal Body Co.
Fisher Body Co., Detroit, Mich.
Fitz Gibbon & Crisp Co., Trenton, N. J.
Gresham Mfg. Co., Griffin, Ga.
Hale & Kilburn Co., Phila., Pa.
Harris-Glenn Body Co., Oxford, N. C.
Herzog Art Furniture Co., Saginaw, Mich.
Hollander & Morrill, Amesbury, Mass.
Howarth & Rogers Co., Amesbury, Mass.
Irwin Mfg. Co., R. J., Indianapolis, Ind.
Keystone Sheet Metal Co., Ambridge, Pa.
Keystone Vehicle Co., Reading, Pa.
Kimball & Co., C. P., Chicago.
Klinger, Louis, New York City.
Lawson Co., The F. H., Cincinnati, O.
Lowell (Mich.) Cutter Co.
Media (Pa.) Carriage Mfg. Co., Cleveland, O.
Mifflinsburg (Pa.) Body & Gear Co., The
Millcreek Wagon Co., Cincinnati, O.
Miller Bros., Inc., Amesbury, Mass.
Miller & Co., A. J., Bellefontaine, O.
Mount Co., J. W., Red Bank, N. J.
New Haven Carriage Co., New Haven, Conn.
Ohio Seat Co., Cincinnati, O.
Parry Mfg. Co., Indianapolis, Ind.
Powitsky & Collins Carriage Woodwork Co., St. Louis, Mo.
Quinby & Co., J. M., Newark, N. J.
Racine Mfg. Co., Racine, Wis.
Rickards & McLaughlin Wagon Co., Philadelphia, Pa.
Rothschild & Company, New York City.
Schubert Bros. Gear Co., Oneida, N. Y.
Sidney (Ohio) Mfg. Co., The Thompson Co., E. J., Pittsburg, Pa.
U. S. Woodworking Co., Buffalo, N. Y.
Vandervort, C. B., Cincinnati, O.
Wiggers Co., Cincinnati, O.
Woodman, Joel H., Hoboken, N. J.
York Wagon Gear Co., York, Pa.

BOLTS AND NUTS, SCREWS AND RIVETS.

For Carriages, Wagons and Automobiles.

Atlas Bolt & Screw Co., Cleveland, O.
Columbus (O.) Bolt Works.
Kirk-Latty Mfg. Co., Cleveland, Ohio.
Milton (Pa.) Mfg. Co., The
Russell, Burdall & Ward Bolt and Nut Co., Port Chester, N. Y.
Skelly & Co., Thomas P., Philadelphia, Pa.

BOLT CLIPPERS

For Carriages, Wagons and Automobiles.

Carolus Mfg. Co., Sterling, Ill.
Chambers Bros. Co., Philadelphia, Pa.
Helwig Mfg. Co., St. Paul, Minn.
Mummert, Wolf & Dixon Co., Hanover, Pa.
Porter, H. K., Everett, Mass.

BOOTS

A. T. A. Nelson Co., Cincinnati
Monarch Carriage Goods Co., Cincinnati, O.

BOWS (Top)

Brown & Co., S. N., Dayton, O.
Delphos Hoop Co., Delphos, O.
Millikan, G. W., Muncie, Ind.

BOW DRESSING MACHINE

Buob & Scheu, Cincinnati, O.

BRASS AUTO SPECIALTIES.

Murphy, G. W. J., Co., Merrimac, Mass.

BRAKES

Ferrel Brake and Mfg. Co., The, Cleveland, O.

BRAKE PARTS.

Morgan Potter Mfg. Co., Fishkill, N. Y.
Royal Equipment Co., The, Bridgeport, Conn.
Thermoid Rubber Co., Trenton, N. J.

BRUSHES AND STRIPERS

For Carriages, Wagons and Automobiles.

Clinton & Co., E., Philadelphia, Pa.
Mack, Andrew, Jonesville, Mich.
Rodriguez, R. E., New York City
Thum, Charles D., Philadelphia, Pa.

BUCKRAMS

Landers Bros. & Co., Toledo, O.
Roehm & Davison, Detroit, Mich.

BUGGIES

Ames-Dean Carriage Co., Jackson, Mich.
Babcock, H. H. & Co., Watertown, N. Y.
Bailey & Co., S. R., Inc., Amesbury, Mass.
Brookshire & Robinson Co., Saint Paris, O.
Colonial Carriage Co., Circleville, O.
Moyer, H. A., Syracuse, N. Y.
Parry Mfg. Co., Indianapolis, Ind.
Peters Buggy Co., Columbus, O.
Staver Carriage Co., Chicago, Ill.
Studebaker Corporation, South Bend, Ind.

**CARRIAGES, WAGONS AND AUTOMOBILES
in the White**

Keystone Vehicle Co., Reading, Pa.
Schubert Wagon Co., August, Oneida, N. Y.
Schubert Bros. Gear Co., Oneida, N. Y.
York (Pa.) Wagon Gear Co.

**CARRIAGES AND WAGONS
Finished**

(Including Buggies, Runabouts, Surreys, Road Carts, Etc.)

Alliance Mfg. Co., Streator, Ill.
American Carriage Co., Cincinnati, O.
Ames Co., The F. A., Owensboro, Ky.
Ames-Dean Carriage Co., Jackson, Mich.
Ann Arbor (Mich.) Buggy Co.
Armleder Co., O., Cincinnati, O.
Atlanta Buggy Co., Atlanta, Ga.
Babcock Co., H. H., Watertown, N. Y.
Bailey & Co., S. E., Lancaster, Pa.
Bailey & Co., S. R., Amesbury, Mass.
Banner Buggy Co., The, St. Louis, Mo.
Bimel Buggy Co., Sidney, O.
Brockway, Inc., W. N., Homer, N. Y.
Brookshire & Robinson, Saint Paris, O.
Brown Carriage Co., Cincinnati
Buob & Scheu, Cincinnati, O.
Carolina Buggy Mfg. Co., Henderson, N. C.
Colonial Carriage Co., Circleville, O.
Columbia (Pa.) Wagon Co.

Columbus Buggy Co., Columbus, Ohio.
 Connersville Buggy Co., Connersville, Ind.
 Continental Carriage Co., Cincinnati, O.
 Deal Buggy Co., Jonesville, Mich.
 Durant-Dort Carriage Co., Flint, Mich.
 Durham Buggy Co., Durham, N. C.
 Ellis Carriage Works, Kinston, Va.
 Emerson Carriage Co., Rock-Empire Carriage Co., Cincinnati, Ind.
 Hackney Bros., Wilson, N. C.
 Hale Buggy Co., Anniston, Ala.
 Haydock Carriage Co., The T. T., Cincinnati, O.
 Hayford & Sons, Edward, Newton, N. H.
 Hercules Buggy Co., Evansville, Ind.
 Hughes Buggy Co., Lynchburg, Va.
 Knight Buggy Co., Inc., Franklin, Va.
 Knightstown (Ind.) Buggy Co., Lane, T. W. Amesbury, Mass.
 Martin Carriage Works, York, Pa.
 Mellen & Svoboda, Mineola, L. I., N. Y.
 Michigan Buggy Co., Kalamazoo, Mich.
 Middletown (O.) Buggy Co.
 Milflinburg (Pa.) Buggy Co.
 Moon Bros. Carriage Co., St. Louis, Mo.
 Moon Buggy Co., Jos. W., St. Louis, Mo.
 Moyer, H. A., Syracuse, N. Y.
 H. R. Nelson, Lena, Ill.
 Owensboro (Ky.) Wagon Co.
 Oxford (N. C.) Buggy Co.
 Parker Mfg. Co., Inc., Suffolk, Va.
 Parry Mfg. Co., Indianapolis, Ind.
 Paterson Co., W. A. Flint, Mich.
 Peters Buggy Co., Columbus, O.
 Piedmont Buggy Co., Monroe, N. C.
 Queen City Carriage Co., The, Cincinnati, O.
 Regal Buggy Co., St. Louis, Mo.
 Rex Buggy Co., Connersville, Ind.
 Sanford Buggy Co., Sanford, N. C.
 Staver Carriage Co., Chicago, Ill.
 Seidel Buggy Co., Richmond, Ind.
 Storm Queen Buggy Co., Wabash, Ind.
 Studebaker Bros. Mfg. Co., So. Bend, Ind.
 Sturtevant-Larrabee Co., Birmingham, N. Y.
 Swab Wagon Co., Elizabethtown, Pa.
 Waters & Sons, G. S., New Bern, N. C.
 York Carriage Co., York, Pa.

CARRIAGE CLOTHS

See Trimming Material.

CARRIAGE FORGINGS

See Forgings.

CARRIAGE SUPPLIES
Miscellaneous

Aden Mfg. Co., (rolling device), Danville, Va.
 Albrecht Co., C. H., Cincinnati, O.
 Alf Co., Edw. F., Cincinnati, O.
 Belmer Co., H., (rubber tire, wire, brazing sleeves, etc.), Cincinnati, O.
 Carpenter & Co., D. L., Cincinnati, O.
 Cincinnati (O.) Iron & Steel Co.
 Cleveland (O.) Akron Bag Co.
 Cowles & Co., C., New Haven, Conn.
 Goshen Eyelet Co., (top trimmings, etc.) Goshen, Ind.
 Higgin Mfg. Co., (trimmings) Newport, Ky.
 Metal Stamping Co., New York
 Mohawk Valley Mfg. Co., Utica, N. Y.
 Mossman, Yarnelle & Co., Ft. Wayne, Ind.
 National Hardware Co., Cincinnati, O.
 Neider Co., F. A., Augusta, Ky.
 Ochsenr & Sons Co., A., (auto and carriage locks) New Haven, Conn.
 Scherer & Co., Detroit, Mich.
 White, H. F., (brazing sleeves) Cincinnati, O.

CASES, TIRE AND TOOL

Merchant & Evans Co., Philadelphia, Pa.

CASTINGSMerrimac (Mass.) Plating Wks
National Brass Mfg. Co., Rochester, N. Y.**CHASSES**Chicago (Ill.) Business Car Co.
Gramm Motor Car Co., Lima, O.
G. J. G. Motor Car Co., White Plains, N. Y.**CHUCKS.**

Onelda National Chuck Co., Onelda, N. Y.

CLUTCHES
Automobile

Merchant & Evans Co., Philadelphia, Pa.

COACH LACE.Bridgeport Coach Lace Co., Bridgeport, Conn.
Schlegel Mfg. Co., Rochester, N. Y.
Vogt Mfg. & Coach Lace Co., Rochester, N. Y.**COLORS**

See Paints.

COUPLINGSBradley, C. C. & Son, Syracuse, N. Y.
Eccles Co., Richard (forgings) Auburn, N. Y.
Fernald Mfg. Co., North East, Pa.
Higgin Mfg. Co., Newport, Ky.
Metal Stamping Co., New York**CURTAIN ROLLERS**

White Mfg. Co., Bridgeport, Conn.

CURLED HAIRDelany & Co., Philadelphia, Pa.
Mitchell & Co., P. R., Cincinnati, O.
Woll, Peter & Sons Mfg. Co., Philadelphia, Pa.**COMMERCIAL MOTOR CARS**

Atterbury Motor Car Co., Buffalo, N. Y.
 Bowling Green (O.) Motor Car Co.
 Cass Motor Truck Co., Port Huron, Mich.
 Chase Motor Truck Co., Syracuse, N. Y.
 Gramm Motor Truck Co., Lima, Ohio
 Hatfield Company, Elmira, N. Y.
 Kearns Motor Car Co., Beavertown, Pa.
 Knox Automobile Co., Springfield, Mass.
 Lansden Co., Newark, N. J.
 McIntyre Co., W. H., Auburn, Ind.
 Motor Wagon Co., Detroit, Mich.
 Penn-Unit Car Co., Allentown, Pa.
 Studebaker Corporation, South Bend, Ind.
 Saurer Motor Truck Co., New York City.

CUSHIONSBaltimore (Md.) Buggy Top Co.
C. L. Dowler, Philadelphia, Pa.**DASHES, FENDERS, ETC.**

Bennett Mfg. Co., (metal) Alden, N. Y.
 Burling, W. G., (metal) Philadelphia, Pa.
 Indianapolis (Ind.) Dash Co.
 McKinnon Dash Co., Buffalo
 Peters & Herron Dash Co., Columbus, O.
 Scherer & Co., H., Detroit, Mich.

DECALCOMANIE TRANSFERS

See Transfer Ornaments.

DRILLS

Barnes, W. F. & John Co. Rockford, Ill.
 Champion Blower & Forge Co., Lancaster, Pa.
 Cincinnati-Bickford Tool Co., Cincinnati, O.
 Cincinnati (O.) Electrical Drill Co.
 Reed Co., Francis, Worcester, Mass.
 Silver Mfg. Co., Salem, O.
 Wells Bros. Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.

DRY GOODS

See Trimmings Materials.

DUCKS

Cotton, Oiled, Enameled, Rubber

Humphrey's Son, R. A., Philadelphia, Pa.

ELECTRIC VEHICLES

S. R. Bailey & Co., Amesbury, Mass.
 Columbus (O.) Buggy Co., Kentucky Wagon Mfg. Co., Louisville, Ky.
 Studebaker Corporation, South Bend, Ind.
 Waverly Co., Indianapolis, Ind.

ELECTRIC LIGHTING AND SPECIALTIES

Morse, Frank W., Boston, Mass.
 Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

ENGINES.

For Automobiles.

Bellfuss Motor Co., Lansing, Mich.
 Willet Engine and Carburetor Co., Buffalo, N. Y.

FELTS, FELT PACKING AND WASHERS.

Booth, N. E., Brooklyn, N. Y.

FIFTH WHEELS

American Roller Bearing Fifth Wheel Co., Brooklyn, N. Y.
 Eberhard Mfg. Co., Cleveland, O.
 Eccles Co., Richard, Auburn, N. Y.
 Dayton (O.) Malleable Iron Co.
 Keystone Forging Co., Northumberland, Pa.
 King Fifth Wheel Co., Philadelphia, Pa. (roller and circle)
 Millersburg Fifth Wheel Co., Millersburg, Pa.
 Queen City Forging Co., Cincinnati, O.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.

FOLDING SEATS
For Automobiles

Buffington & Co., C. A., Berkshire, N. Y.
 Graves & Congdon Co., Amesbury, Mass.
 Hodge & Graves Co., Amesbury, Mass.

FORGINGS

Atwater Mfg. Co., Plantsville, Conn.
 Blakeslee Forging Co., Plantsville, Conn.
 Clapp Mfg. Co., E. D. Auburn, N. Y.
 Cleveland (O.) Hardware Co.
 Columbus (O.) Bolt Works
 Cortland (N.Y.) Carriage Goods Co.
 Cortland (N.Y.) Forging Co.
 Crandal, Stone & Co., Birmingham, N. Y.
 Detroit (Mich.) Socket Co.
 Diamond Forging & Mfg. Co., Pittsburg, Pa.
 Eccles Co., Richard, Auburn, N. Y.
 Herbrand Co., Fremont, O.
 Higgins Spring & Axle Co., Racine, Wis.
 Indiana Forging Co., Indianapolis, Ind.
 Keystone Forging Co., Northumberland, Pa.
 Queen City Forging Co., Cincinnati, O.
 Scherer & Co., H., Detroit, Mich.
 Scranton (Pa.) Forging Co.
 Union (N. Y.) Forging Co.

Smith & Co., H. D., Plantsville, Conn.
 Wilcox, Mfg. Co., D., Mechanicsburg, Pa.

FRINGES

Schlegel Mfg. Co., Rochester, N. Y.
 Vogt Mfg. & Coach Lace Co., Rochester, N. Y.

GEARS

For Carriages, Wagons and Automobiles.

Akron-Selle Co., Akron, O.
 Fitch Gear Co., Rome, N. Y.
 Frost Gear & Machine Co., Jackson, Mich.
 Holt Bros. Mfg. Co., Concord, N. H.
 Milflinburg Body & Gear Co., Milflinburg, Pa.
 Mulholland Co., Dunkirk, N. Y.
 Schubert Co., Aug., Onelda, N. Y.
 Schubert Bros. Gear Co., Onelda, N. Y.
 York (Pa.) Wagon Gear Co.

GEAR WOOD

Buckeye Handle, Gear & Bending Co., Alliance, O.
 Conkle Co., B. F., Junction City, Ohio
 Cooper Carriage Woodwork Co., St. Louis, Mo.
 Eureka Bending & Wheel Wks., York, Pa.
 Kimble, Andrew, Zanesville, O.
 Newark (O.) Gear Wood Co.
 Zanesville (O.) Gear Wood Co.

GLASS.

Shoemaker, B. H., Philadelphia

GLUE AND CURLED HAIR

For Carriages, Wagons and Automobiles.

Baeder, Adamson & Co., Philadelphia, Pa.
 Delany & Co., Philadelphia, Pa.
 Woll & Co., F. P., Frankford, Philadelphia, Pa.

GREASE

Moore Oil Co., Cincinnati, O.

HAMMERS

Bradley & Son, C. C., Syracuse, N. Y.
 Davis Co., G. E., Dubuque, Ia.
 Hawkeye Mfg. Co., Cedar Rapids, Ia.
 Kerrhard Co., Red Oak, Ia.
 Lang & Allstatter Co., Hamilton, O.
 MacGowan & Finigan Foundry and Mach. Co., St. Louis, Mo.
 Mayer Bros. Co., Mankato, Minn.
 Smith, H. C., Detroit, Mich.
 West Tire Setter Co., Rochester, N. Y.

HARDWARE

Carriage, Wagon and Automobile Supplies, Etc.

Blakeslee Forging Co., Plantsville, Conn.
 Chase Parker & Co., Boston, Mass.
 Cleveland Hardware Co., The, Cleveland, O.
 Cortland Carriage Goods Co., Cortland, N. Y.
 Cortland Forging Co., Cortland, N. Y.
 Cowles & Co., C., New Haven, Conn.
 Crandal, Stone & Co., Birmingham, N. Y.
 Dayton (O.) Malleable Iron Co.
 Detroit (Mich.) Socket Co.
 Dowler, Chas. L., Philadelphia.
 Doney, N. D., Elmira, N. Y.
 Eberhard Mfg. Co., Cleveland, O.
 Eccles Co., R., Auburn, N. Y.
 English & Mersick Co., The, New Haven, Conn.
 Franke Co., C. D., Charleston, S. C.
 Gerhab, Jacob, Philadelphia, Pa.
 Gifford & Son., John A., New York City.
 Higgin Mfg. Co., Newport, Ky.
 Kennedy, William & Co., Philadelphia, Pa.
 Keystone Forging Co., Northumberland, Pa.

Landers Bros. Co., Toledo, O.
McLain, Willig & Cross, New
Mohawk Valley Mfg. Co., Utica,
N. Y.
York City.
Nelder Co., The F. A., Augusta,
Ky.
Norris & Sons, R. W. Balti-
more, Md.
Novelty Mfg. Co., The, Water-
bury, Conn.
Ochsner, A. & Sons Co., New
Haven, Conn.
Payne Co., E. Scott, Baltimore,
Md.
Queen City Forging Co., Cincin-
nati, O.
Roehm & Davison, Detroit,
Mich.
Russell, Burdall & Ward Bolt
and Nut Co., Port Chester,
N. Y.
Smith & Co., Jos. N., Detroit,
Mich.
Spring Cleat Co., Frankford,
Philadelphia, Pa.
Union Forging Co., Union, N.Y.
Wilcox, D., Mfg. Co., Mechan-
icsburg, Pa.
Wing Co., The C., Amesbury,
Mass.

HUB BANDERS

West Tire Setter Co., Roches-
ter, N. Y.

HUB BORING MACHINE

Moyer, H. A., Syracuse, N. Y.

IRON AND STEEL

Cincinnati (O.) Iron and Steel
Co.
Harrow Spring Co., Kalamazoo,
Mich.
Railway Steel Spring Co., De-
troit, Mich.
Union Drawn Steel Co., Beaver
Falls, Pa.

JACKS

Eureka Mower Co., Utica, N.Y.

JACKS (Trestle)

Hoof & Co., J. C., Chicago, Ill.

**JACK SHAFTS
For Automobiles.**

Frost Gear & Machine Co., Jack-
son, Mich.
Merchants & Evans Co., Phila-
delphia, Pa.
Timken-Detroit Axle Co., De-
troit, Mich.

KNIVES (Planing)

Coes & Co., Inc., L., Worcester,
Mass.

LAMPS

For Carriages, Wagons and
Automobiles.

Badger Brass Mfg. Co., Kenos-
ha, Wis.
Brown Mfg. Co., J. W., Colum-
bus, O.
Castle Lamp Co., Amesbury,
Mass.

Corcoran Lamp Co., Cincinnati
Coles & Co., C., New Haven,
Conn.

Indiana Lamp Co., Conners-
ville, Ind.
Metropolitan Lamp Co., New-
ark, N. J.

Richmond (Ind.) Lamp Mfg. Co.
Rose Mfg. Co., Philadelphia, Pa.
Scoville & Peck Co., New Hav-
en, Conn.

Victor Lamp Co., Cincinnati, O.
White Mfg. Co., Bridgeport,
Conn.

**LEATHER, PATENT AND
ENAMELED**

For Carriages, Wagons and
Automobiles.

American Oak Leather Co., Cin-
cinnati, O.
Ashtabula Hide & Leather Co.,
Ashtabula, O.
Backstay Machine & Leather
Co., Union City, Ind.
Bridgeport (Conn.) Patent
Leather Mfg. Co.
Byron & Sons, Inc., W. D., Wil-
liamsport, Md.

Carter Co., G. R., Connersville,
Ind.
Cincinnati (O.) Hide & Leather
Co.
Cleveland (O.) Tanning Co.
Dannenhauer Leather Co., Phil-
adelphia, Pa.
Decker, J. C., Montgomery, Pa.
Diefenthaler, J. V., Newark, N.J.
Eldred (Pa.) Leather Co.
McCormick & Sons, E.H., New-
ark, N. J.
National Leather Co., Pitts-
burg, Pa.
Nelson Co., A. T. A., Cincinna-
ti, O.
Raser Tanning Co., Ashtabula,
Ohio.
Reilly Co., John, Newark, N.J.
Reilly & Son, J. P., Newark, N.J.
Smith & Sons, L. M., Newark,
N. J.
Smyth Co., Chas., Newark, N.J.
Straus & Sons, M., Newark, N.J.
Ward & Co., E. S., Newark, N.J.

LEATHER SUBSTITUTES

Dannenhauer, C. W., Philadel-
phia, Pa.
Fabrlokoid Co., Newburg, N. Y.
Fairfield (Conn.) Rubber Co.
Kerato Co., Newark, N. J.
O'Bannon Corp., New York.
Pantastote Co., New York City.
Potter, Thos., Sons & Co., Inc.,
Philadelphia, Pa.
Standard Oil Cloth Co., New
York City.

**LEATHER MEASURING MA-
CHINE**

Tufting Machine Supply Co.,
Chicago, Ill.

LEATHER SPECIALTIES

Art Leather, Leather Straps,
Auto Straps.

Backstay Machine & Leather
Co., Union City, Ind.
Brace Leather Goods Co., Pon-
tiac, Mich.
Carter, G. R., Connersville, Ind.
Cincinnati (O.) Hide & Lea. Co.
Decker, J. C., Montgomery, Pa.
Nelson Co., A.T.A., Cincinnati
Springfield (Mass.) Harness Co.

LINSEED OIL

Sherwin-Williams Co., Cleve-
land, O.

LUMBER

Anderson-Tully Co., Memphis,
Tenn.
Baker Lumber Co., Turrell, Ark.
Brown Bros. Hardwood Co.,
Gainesville, Fla.
Carrier Lumber & Mfg. Co.,
Sardis, Miss.
Crane & MacMahon (hardwood)
New York City.
Gardner Artificial Lumber Co.,
Barberton, O.
Darling Lumber Co., J.W., Cin-
Himmelberger-Harrison Lum-
ber Co., Cape Girardeau, Mo.
Lamb-Fish Lumber Co., Charles-
ton, Miss.
Long-Knight Lumber Co., In-
dianapolis, Ind.
Luehrmann Hardwood Lumber
Co., C. F., St. Louis, Mo.
Shiels & Co., C. F., Cincinnati
Three States Lumber Co., Mem-
phis, Tenn.

MACHINERY AND TOOLS

For Carriages, Wagons and
Automobiles.

American Tire Drill Co., Cin-
cinnati, O.
Badger State Mach. Co., Janes-
ville, Wis.
Baldwin & Brown, Inc., Rich-
mond, Va.
Bartlett, E. E., Boston, Mass.
Bentel & Margedant Co., Ham-
ilton, O.
Bicknell Mfg. & Supply Co.,
Janesville, Wis.
Bliss Co., E. W., Brooklyn, N.Y.
Bokop, Webb & Palm, Defiance,
Ohio
Boynton & Plummer, Worces-
ter, Mass.
Buffalo (N.Y.) Forge Co.
Champlon Blower & Forge Co.,
Lancaster, Pa.

Crescent Electric Mfg. Co.,
Cleveland, O.
Davis Co., G. E., Dubuque, Ia.
Defiance (O.) Machine Works.
Fay & Egan Co., J. A., Cincin-
nati, O.
Frost Gear & Machine Co.,
Jackson, Mich.
Heartley Machine, Variety Iron
& Tool Works, Toledo, O.
Long & Allstatter Co., Hamill-
ton, O.
Lounsbery, G. H. & Sons, Cin-
cinnati, O.
Lourie Mfg. Co., Springfield, Ill.
Massachusetts Machine Shop
Co., Worcester, Mass.
Morse Twist Drill & Machine
Co., New Bedford, Mass.
Pettingell Machine Co., Ames-
bury, Mass.
Porter, H. K., Everett, Mass.
Pugh, Job T., Philadelphia, Pa.
Rechlin Co., L. E., Cincinnati
Root Co., B. M., York, Pa.
Russell & Irwin Mfg. Co., New
Britain, Conn.
Schelp, G. H., St. Louis, Mo.
Smith, H. Collier, Detroit, Mich.
Smith & Co., H. D., Plantsville,
Conn.
Stow Mfg. Co., Binghamton,
N. Y.
Swan Co., J., Seymour, Conn.
U. S. Electrical Tool Co., Cin-
cinnati, O.
West Tire Setter Co., Roches-
ter, N. Y.

**MACHINERY
Metal Working**

Bliss & Co., E.W., Brooklyn, NY
Pettingell Machine Co., Ames-
bury, Mass.
Smith, H. C., Detroit, Mich.

MACHINERY

See Tire Setting Machines.
See Tufting Machines.
See Wood Working Machines.

MALLEBALES.

Dayton (O.) Malleable Iron Co.
Eberhard Mfg. Co., Cleveland, O.

MEASURING MACHINES

Tufting Machine Supply Co.,
Chicago, Ill.

METAL SPECIALTIES

Hoods, Tanks, Fenders, Guards

A-Z Co., The, New York City.
Burling, W. G., Philadelphia, Pa.
Keystone Sheet Metal Co., Am-
bridge, Pa.
Lauson & Co., F. H., Cincinna-
ti, O.

MONOGRAMS AND SCROLLS

Barrett, J. P., South Coventry,
Conn.

MOTORS

Bellfuss Motor Co., Lansing,
Mich.
Hazard Motor Mfg. Co., Roch-
ester, N. Y.
Westinghouse Electric & Mfg.
Co., East Pittsburg, Pa.

MOTOR PARTS

Bridgeport (Conn.) Brass Co.,
Merchant & Evans Co., Phila-
delphia, Pa.
Muncie (Ind.) Gear Works.
National Brass Mfg. Co., Roch-
ester, N. Y.
Seward M. & Son Co., New
Haven, Conn.

MOTOR TRUCKS

Bowling Green Motor Car Co.,
Bowling Green, O.
Gram Motor Car Co., Lima, O.
McIntyre Co., W. H., Auburn,
Ind.

MOTOR VEHICLES

Durvae Auto Co., Saginaw,
Mich.

MOULDINGS (Automobile)

Bridgeport (Conn.) Brass Co.
Jonah & George, Merrimac,
Mass.

MOUNTINGS

For Carriages, Wagons and
Automobiles.

Baker, W. C., Amesbury, Mass.
Balzer Co., Inc., G., New York
Colgan Co., J. W., Boston, Mass.
Cowles & Co., C., New Haven,
Conn.
Crowe Nameplate & Engraving
Co., Chicago, Ill.
Dietz Co., R. E., New York City
Douglas & Lomason Co., De-
troit, Mich.
Eastern Brass Co., Lynn, Mass.
Enterprise Brass & Plating Co.,
Cincinnati, O.
Indiana Lamp Co., Conners-
ville, Ind.
Jonah & George, Merrimac,
Metropolitan Lamp Co., New-
ark, N. J.
Merrimac Plating Works, Mer-
rimac, Mass.
Ochsner & Sons Co., A., New
Haven, Conn.
Richmond (Ind.) Mfg. Co.
Seales Mfg. Co., Newark, N.J.
Smith & Co., J. N., Detroit, Mich.
White Mfg. Co., Bridgeport,
Conn.

MUFFLERS (Auto)

Mohawk Valley Mfg. Co., Utica,
N. Y.

NAME PLATES

Crowe Name Plate and Eng.
Co., Chicago, Ill.
Dayton (O.) Stencil Works.
O'Connor, J., Cincinnati, O.
Wadsworth Eng. Co., Spring-
field, O.
Withers, Geo. B., Albany, N.Y.

NUTS

See Bolts.

OIL CLOTH, ETC.

For Carriages, Wagons and
Automobiles.

Cook's Linoleum Co., Trenton,
N. J.
Monarch Rubber and Oil Cloth
Co., Philadelphia, Pa.
Potter, Sons & Co., Thomas,
Philadelphia, Pa.
Standard Oil Cloth Co., New
York City.
Strong, M. H., Rochester, N. J.
Taunton Oil Cloth Co., Taun-
ton, Mass.

**OIL
For Automobiles**

Havoline Oil Co., New York
City.
Moore Oil Co., Cincinnati, O.

PAINTS AND COLORS

For Carriages, Wagons and
Automobiles

Cincinnati (O.) Color Co.
Devoe, F. W., & C. T. Raynolds
Co., New York City
Ditzler Color Co., Detroit, Mich.
Elmendorf Varnish Co., Chica-
go, Ill.
Felton, Sibley & Co., Inc., Phil-
adelphia, Pa.
Flint (Mich.) Varnish Works.
Glidden Varnish Co., Cleveland
Harland & Son, Wm., Buffalo.
Hildreth Varnish Co., New York
Johnston Paint Co., R. F., Cin-
cinnati, O.
Keystone Paint & Filler Co.,
Muncy, Pa.
Lowe Brothers Co., Dayton, O.
Masury & Son, Brooklyn, N. Y.
Mitchell Varnish Co., Camden,
N. J.
Moller & Schumann Co., Brook-
lyn, N. Y.
Mound City Paint & Color Co.,
St. Louis, Mo.
Pierce Co., F. O., New York
Pomeroy & Fischer, New York
City.
Rub-On Varnish Co., Buffalo,
N. Y.
Sherwin-Williams Co., Cleve-
land, O.
Smith & Co., Edw., New York.
U. S. Varnish Co., Cincinnati, O.
Valentine & Co., 257 Broadway,
New York; 277 Dearborn St.,
Chicago; 74 Pearl St., Boston
Willey Co., C. A., New York.

PASTE

Anchor Paste Co., Baltimore, Md.
Buckeye Paste Co., Columbus, O.
Indianapolis (Ind.) Paste Co.

PLATER

Silver, Brass, Oxide and Nickel
Kuhles, Chas. A., Chicago, Ill.

POLES AND SHAFTS

Single, and Double Trees, Bars
and Circles.

American Pole & Shaft Co.,
Cincinnati, O.
Campbell & Dann Mfg. Co., Tul-
lahoma, Tenn.
Cartier Sons Co., A. E., Luding-
ton, Mich.
Mills Ellsworth & Co., Keokuk,
Ia.
Moline (Ill.) Pole & Shaft Co.,
Pioneer Pole & Shaft Co., Pi-
qua, O.
Sidney (O.) Mfg. Co.
Von Behren Mfg. Co., Evans-
ville, Ind.

PONY VEHICLES

Brookshire & Robinson, Saint
Paris, O.
Colfax Mfg. Co., South Bend,
Ind.
Michigan Buggy Co., Kalamazoo,
Mich.
Queen City Carriage Co., Cin-
cinnati, O.

PRESSES (Arbor)

Bartlett, E. E. Boston, Mass.

PUMPS (Tire)

Bridgeport (Conn.) Brass Co.
Coe-Stapley Mfg. Co., Bridge-
port, Conn.

**RADIATORS
For Automobiles**

English & Mersick Co., New
Haven, Conn.
Feddars Mfg. Works, Buffalo,
Mayo Radiator Co., New Haven,
Conn.

RAILS

Douglas & Lomasson Co., De-
troit, Mich.

RAILS, ETC.

See Mountings.

RIMS

For Automobiles

United Rim Co., Akron, O.

RIVETS

See Bolts

ROAD CARTS

Parry Mfg. Co., Indianapolis,
Ind.

ROLLER BEARINGS

Bower Roller Bearing Co., De-
troit, Mich.
Hyatt Roller Bearing Co., De-
troit, Mich.
Makutchan Roller Bearing Co.,
Chicago, Ill.
Standard Roller Bearing Co.,
Philadelphia, Pa.
Timken Roller Bearing Co.,
Canton, O.

ROLLER CHAFE IRONS

Mohawk Valley Mfg. Co., Utica,
N. Y.
National Roller Chafe Iron Co.,
West Medway, Mass.

**RUBBER MATS AND MAT-
TING**

Acme Rubber Mfg. Co., Tren-
ton, N. J.

RUBBER TIRES

Acme Rubber & Mfg. Co., Tren-
ton, N. J.
Auto-Emergency Mfg. Co., Bal-
timore, Md.

Batavia (N.Y.) Rubber Co.
Consolidated Rubber Tire Co.,
New York City.
Diamond Rubber Co., Akron, O.
Federal Rubber Mfg. Co., Mil-
waukee, Wis.
Firestone Tire & Rubber Co.,
Akron, O.
Fisk Rubber Co., Chicopee Falls
Mass.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co.,
Akron, O.
Imperial Rubber Mfg. Co., Can-
ton, O.
Kelly-Springfield Tire Co., New
York City
Kokomo (Ind.) Rubber Co.
Motz Tire & Rubber Co., Ak-
ron, O.
Racine Auto Tire Co., Racine,
Wis.
Republic Rubber Co., Young-
town, O.
Stein Double Cushion Tire Co.,
Akron, O.
Swinehart Tire & Rubber Co.,
Akron, O.
Thermoid Rubber Co., Tren-
ton, N. J.
United States Tire Co., New
York City
Victor Rubber Co., Springfield,
Ohio.

RUBBER TIRES

Continuous and Sectional, For
Trucks.

Consolidated Rubber Tire Co.,
New York City; same as Kelly
Springfield Tire Co., New
York City.

RUBBER TIRES

Solid, for Carriages

Consolidated Rubber Tire Co.,
New York City, same as Kelly
Springfield Tire Co., New
York City.

RUBBER TIRE PROTECTORS

Indiana Rubber & Insulated
Wire Co., Jonesboro, Ind.
Leather Tire Goods Co., Niag-
ara Falls, N. Y.
Queen Mfg. Co., Webster City,
Iowa.
Racine Auto Tire Co., Racine,
Wis.

RUBBER TIRING MACHINE

Enterprise Foundry, Harvey, Ill.

**SAND BANDS—AXLE PRO-
TECTORS**

Farr, Willis M., Dowagiac, Mich.

SEATS

See Bodies.

SHAFTS AND POLES

See Poles and Shafts.

SHAFT COUPLINGS

(Including Anti-Rattlers Quick-
Shifters and Pole Couplings.)

Bradley & Son, C. C., Syracuse,
N. Y.
Eccles Co., R., Auburn, N. Y.
Fernald Mfg. Co., No. East, Pa.
Higgin Mfg. Co., Newport, Ky.
Metal Stamping Co., Long Is-
land City, N. Y.

SHAFT STRAPS

See Leather Specialties

SHOCK ABSORBERS

Weston Mfg. Co., Newark, N.J.

SHORT TURNING GEARS

Eadie Vehicle Gear Co., New
York City

SLEIGHS

Ames-Dean Carriage Co., Jack-
son, Mich.
Lull Carriage Co., Kalamazoo,
Mich.
Sturtevant-Larrabee Co., Bing-
hamton, N. Y.
Sullivan Bros., Rochester, N.Y.

SLEIGH RUNNERS

Ames-Dean Carriage Co., Jack-
son, Mich.
Schofield & Co., Freeport, Ill.

SOCKETS (Bow)

Ashtabula (O.) Bow Socket Co.
Cleveland (O.) Hardware Co.
Cortland (N.Y.) Carriage Goods
Co.
Cortland (N.Y.) Forging Co.
Detroit (Mich.) Socket Co.

SPOKE MANUFACTURERS

Blanchard Co., N. C., Spring
Bimel-Ashcroft Mfg. Co. Pop-
lar Bluff, Mo.
Small Spoke Co., Corinth, Miss.
Sparta (Tenn.) Spoke Factory,
Winch Spoke Co., Branson, Mo.
City, Tenn.

SPONGES AND CHAMOIS

Joseph Niehaus Co., Cincinnati,

SPRINGS

For Carriages, Wagons and
Automobiles

Ansted Spring & Axle Co., Con-
nersville, Ind.
Cleveland-Canton Spring Co.,
Canton, O.
Cincinnati & Hammond Spring
Co., Cincinnati, O.
Delany & Son, D., Newark, N.J.
Harvey Spring Co., Racine, Wis.
Harrow Spring Co., Kalamazoo,
Mich.
Hess-Pontiac Spring & Axle Co.
Pontiac, Mich.
Higgins Spring & Axle Co., Ra-
cine, Wis.
Insull, Thos., Philadelphia, Pa.
Kalamazoo (Mich.) Spring &
Axle Co.
Keystone Spring Works, Phila-
delphia, Pa.
Lewis Spring & Axle Co., Jack-
son, Mich.
Liggett Spring & Axle Co.,
Pittsburg, Pa.
Merrill Spring Co., E. R., New
York City.
Mulholland Co., Dunkirk, N. Y.
Perfection Spring Co., Cleveland
Rowland, Wm. & Harvey, Phila-
delphia, Pa.
Scranton (Pa.) Axle & Spring
Co.
Schubert Bros. Gear Co., Onel-
da, N. Y.
Sheldon Axle Co., Wilkes-Barre,
Pa.
Spring Perch Co., Bridgeport,
Conn.
Tuthill Spring Co., Chicago, Ill.
Watertown (N. Y.) Spring Co.
Western Spring & Axle Co.,
Cincinnati, O.

SPRINGS

Cushion Seat Construction.

Barber Mfg. Co., Anderson, Ind.
D'Arcy Spring Co., Kalamazoo,
Mich.
Jackson (Mich.) Cushion Spring
Co.
Murray, Wm. A., Cincinnati, O.
National Spring & Wire Co.,
Albion, Mich.
Staples & Hanford, Newburg,
N. Y.
Trenton (N.J.) Spring Mattress
Co.

STEEL WHEELS

Standard Wheel Co., Toledo, O.

STEPS (Rubber Covered)

Cleveland (O.) Hardware Co.
Rubber Step Mfg. Co., Exeter,
N. H.

STORAGE BATTERIES

See Batteries.

**STORM BUGGIES and STORM
TOPS**

Ahlbrand Carriage Co., Sey-
mour, Ind.
Eckhart Carriage Co., Auburn,
Ind.
Haydock Carriage Co., Cincin-
nati, O.
Parry Mfg. Co., Indianapolis,
Patterson & Son, C. R., Green-
field, O.

Rex Buggy Co., Connersville,
Ind.
Seidel Buggy Co., Richmond,
Ind.
Storm Queen Buggy Co., Wa-
bash, Ind.
Studebaker Corporation, South
Bend, Ind.
Zimmerman Mfg. Co., Auburn,
Ind.

**STRIPING AND STENCIL
WHEEL.**

Uebelmesser Co., C. R., New
York City.

**TANKS
For Automobiles**

Janney-Steinmetz & Co., Phila-
delphia, Pa.

THREADS

Meyer & Co., J. C., Lowell, Mass

TIRE CASES

Gilbert Mfg. Co., New Haven,
Conn.

TIRE SETTERS

Brooks Tire Machine Co., Wich-
ita, Kas.
House Cold Tire Setter Co., St.
Louis, Mo.
Keokuk Hydraulic Tire Setter
Co., Keokuk, Iowa.
Lourie Mfg. Co., Springfield, Ill.
West Tire Setter Co., Roches-
ter, N. Y.

TOOLS

See Machinery.

TOPS AND TOP PARTS

For Carriages, Wagons and
Automobiles

Atlanta Automobile Top &
Trimming Co., Atlanta, Ga.
Baker Bros Mfg. Co., Cincinnati
Baltimore (Md.) Buggy Top Co.
Buob & Scheu, Cincinnati, O.
Cleveland (O.) Hardware Co.
Crandall, Stone & Co., Bingham-
ton, N. Y.
Ennis, Wm. G., Charleston, S.C.
Falls City Buggy Top Co., Louis-
ville, Ky.
Fischer & Metzger, Cincinnati
Golde-Patent Mfg. Co., New
York City.
Irwin Mfg. Co., R. J., (auto)
Indianapolis, Ind.
National Auto Top Co., New
York City.
Ohio Top Co., Cincinnati, O.
Parry Mfg. Co., Indianapolis,
Ind.
Ritter Mfg. Co., Detroit, Mich.
Schubert Bros. Gear Co., Onel-
da, N. Y.
Schubert Wagon Co., August,
Onelda, N. Y.
Snow, N. H., Binghamton, N.Y.
Springfield (Mass.) Harness Co.
(auto)
Troy Carriage Sun Shade Co.,
Troy, O.
U. S. Wood Working Co., Buf-
falo, N. Y.

TOP HARDWARE

For Carriages, Wagons and
Automobiles

Ashtabula (O.) Bow Socket Co.
Balzer, Co., Gus, New York City
Cately & Ettling, Cortland, N.Y.
Cleveland (O.) Hardware Co.
Cook Carriage Goods Co., Fos-
toria, O.
Cortland (N.Y.) Carriage Goods
Co.
Cortland (N.Y.) Forging Co.
Cowles & Co., C., New Haven,
Conn.
Crandall, Stone & Co., Bing-
hamton, N. Y.
Detroit (Mich.) Auto Top Fas-
tener Co.
Detroit (Mich.) Socket Co.
Ervin, Horace, Ogontz, Pa.
Higgin Mfg. Co., Newport, Ky.
Jonah & George, Merrimac, Mass.
Metal Stamping Co., Long Is-
land City, N. Y.
Murphy Co., G. W. J., Merri-
mac, Mass.
Neider Co., F. A., Augusta, Ky.
Parry & Co., A. N., Amesbury,
Mass.

TOP HARDWARE (Continued)

Queen City Forging Co., Cincinnati, O.
Tufting Machine Supply Co., Chicago, Ill.

TOP AND UPHOLSTERY DRESSING

West Mfg. Co., Rockford, Ill.

TRANSFER ORNAMENTS

Meyercord Co., Chicago, Ill.
National Decalcomania Co., Philadelphia, Pa.
Palm-Fechteler Co., New York

TRANSMISSIONS

Frost Gear & Machine Co., Jackson, Mich.
Hazard Motor Mfg. Co., Rochester, N. Y.
Merchant & Evans Co., Philadelphia, Pa.
Muncie Gear Works, Muncie, Ind.

TRIMMING MATERIAL

Rubber Drills, Enameled Goods, Imitation Leather, Etc.

For Carriages, Wagons and Automobiles

Acme Rubber Mfg. Co., Trenton, N. J.
Aif Co., E. F., Cincinnati, O.
Bailey Co., G. W., Brockton, Mass.
Carr Co., F. S., Boston, Mass.
Chase, L. C. & Co., Boston
Cochrane Mfg. Co., East Dedham, Mass.
Dusenbury & Co., Inc., Louis New York City.
Derby & Co., W. E., New York
Fabrikoid Co., Newburg, N. Y. and Wilmington, Del.
Fairfield Rubber Co., Fairfield, Conn.
Fine Woolen Co., New York
Gifford & Son, John A., New York City.
Keratol Co., Newark, N. J.
Laidlaw, Jr., Wm. R., New York
Landers Bros. Co., Toledo, O.
Lane & Co., J. H., New York
Monarch Carriage Goods Co., Cincinnati, O.
Muttly Co., L. J., Boston, Mass.
National Hardware Co., Cincinnati, O.
O'Bannon Corporation, New York
Pantasote Co., New York City.
Roehm & Davison, Detroit, Mich.
Rogers & Co., E. F., Philadelphia, Pa.
Roy Woolen Co., Watervliet, N. Y.
Scherer & Co., H., Detroit, Mich.
Schlegel Mfg. Co., Rochester, N. Y.
Smyth Company, C., Newark, N. J.
Sligo Iron Store, St. Louis, Mo.
Standard Oil Cloth Co., New York
Tiel & Co., G. Philadelphia, Pa.
Wiese & Co., Wm., New York
Wing Co., C., Amesbury, Mass.

TRESTLES (Steel)

Hildreth Co., S. M., New York

TRESTLES (Folding Steel)

Frasse & Co., P. A., New York

TRUCKS

For Carriage, Wagon and Automobile Builders.

Beckert, Wm., Allegheny, Pa.

TUFTING MACHINE AND SUPPLIES

Buser-Poston Tufting Machine Co., Chillicothe, O.
Novelty Tufting Machine Co., Chicago, Ill.

VARNISHES, PAINTS AND JAPANS

For Carriages, Wagons and Automobiles

Acme White Lead & Color Wks., Detroit, Mich.
American Varnish Co., Chicago
Bellings-Chapin Co., Cleveland

Brooks & Co., C., Newark, N. J.
Buckeye Paint & Varnish Co., Toledo, O.
Cincinnati (O.) Color Co., Cincinnati, O.
Detroit (Mich.) White Lead Co., Detroit, Mich.
Devos, F. W., & C. T. Reynolds Co., New York City.
Ditzler Color Co., Detroit, Mich.
Elmendorf Varnish Co., Chicago, Ill.
Felton, Sibley & Co., Philadelphia, Pa.
Flint Varnish Co., Flint, Mich.
Forbes Varnish Co., Cleveland
French, S. H. & Co., Philadelphia, Pa.
Glidden Varnish Co., Cleveland
Harland, Wm. & Son, Buffalo
Hildreth Varnish Co., New York
Johnston, R. F., Paint Co., Cincinnati, O.
Keystone Paint & Filler Co., Muncie, Pa.
Lauderbach, A. E., (Manders) New York City
Lowe Bros. Co., Dayton, O.
Masury & Son, J. W., New York and Chicago
Mitchell Varnish Works, Camden, N. J.
Moller & Schumann Co., Brooklyn, N. Y.
Moore & Co., Benj., Cleveland
Mound City Paint & Color Co., St. Louis, Mo.
Murphy Varnish Co., Newark, N. J.
Parrott Varnish Co., Bridgeport, Conn.
Pierce Co., F. O., New York
Pomeroy & Fischer, New York
Rambo, Theo. G., Philadelphia
Rub-On Varnish Co., Buffalo
St. Louis (Mo.) Surfer and Paint Co.
Sherwin-Williams Co., Cleveland, O.
Standard Varnish Co., New York and Chicago.
Stewart-Mowry Co., Chicago
Stuhl Varnish Co., J., Philadelphia, Pa.
Twin City Varnish Co., St. Paul, Minn.
U. S. Varnish Co., Cincinnati, O.
Valentine & Co., 257 Broadway, New York; 277 Dearborn St., Chicago; 74 Pearl St., Boston
Wiley Co., C. A., Hunter's Pt., New York.

VEHICLES

Ames-Dean Carriage Co., Jackson, Mich.
Babcock, H. H. & Co., Watertown, N. Y.
Bailey & Co., S. R., Inc., Amesbury, Mass.
Brookshire & Robinson, Saint Paris, O.
Colonial Carriage Co., Circleville, O.
Moyer, H. A., Syracuse, N. Y.
Parry Mfg. Co., Indianapolis
Peters Buggy Co., Columbus, O.
Staver Carriage Co., Chicago
Studebaker Corporation, South Bend, Ind.

WAGON MANUFACTURERS.

Armleder Co., (heavy) Cincinnati, O.
Auburn Wagon Co., Martinsburg, W. Va.
Blume Wagon Works, Scranton
Columbia (Pa.) Wagon Co.
Finnesey & Kobler, Philadelphia, Pa.
Florence (Ala.) Wagon Co.
Hoover Wagon Co., York, Pa.
Johnson Carriage Co., Oxford, Pa.
Kentucky Wagon Mfg. Co., Louisville, Ky.
Owensboro (Ky.) Wagon Co.
Rech-Marbacker Co., Philadelphia, Pa.
Studebaker Corporation, South Bend, Ind.
Troy (O.) Wagon Works Co.

WASHERS

Carriage, Automobile and Wagon.

Gaylord Sanitary Mfg. Co., Co., Rochester, N. Y.

WASHERS (Felt)

Booth, N. E., Brooklyn, N. Y.

WASHERS (Metal)

See Bolts.

WELDING COMPOUNDS

Anti-Borax Compound Co., Ft. Wayne, Ind.
Cortland (N.Y.) Welding Compound Co.

WELDING MACHINES

Sanford Mfg. Co., F. C., Bridgeport, Conn.

WELTS, BINDINGS AND GUIMPS

For Carriages and Automobiles

Bauer Bros. Mfg. Co., Cincinnati, O.
Byron & Sons, W. D., Williamsport, Md.
Carter, G. R. Co., Connersville, Ind.
Casey Mfg. Co., Detroit, Mich.
Cincinnati Welt Co., Cincinnati
Wade Mfg. Co., Brockton, Mass.

WHEELS AND WHEEL STOCK

For Carriages, Wagons and Automobiles

Archibald Wheel Co., Lawrence, Mass.
Avoca Wheel Co., Avoca, N. Y.
Baltimore Hub Wheel & Mfg. Co., Baltimore, Md.
Bimel Spoke & Auto Wheel Co., Portland, Ind.
Boob Wheel Co., Cincinnati, O.
Bookwalter Wheel Co., Miamisburg, O.
Buckeye Wheel Co., Gallon, O.
Crane & MacMahon, New York
Central City Wheel Works, Syracuse, N. Y.
Eberly & Orris Mfg. Co., Mechanicsburg, Pa.
Eureka Bending & Wheel Wks., York, Pa.
Franklin (O.) Wheel Co.
Ford & Co., Tippecanoe City, O.
Gifford & Son, John A., New York
Hayes Wheel Co., Jackson, Mich.
Holligsworth Wheel Co., Hagerstown, Md.
Holt Bros. Mfg. Co., Concord, N. H.
Hoopes Bros. & Darlington, West Chester, Pa.
Imperial Wheel Co., Flint, Mich.
Jones & Co., Phineas, Newark, N. J.
Louisville Wheel Co., Louisville, Ky.
Merrimack Wheel Co., Amesbury, Mass.
Mitchell Wheel Co., Miamisburg, O.
Muncie (Ind.) Wheel Co.
Ness Bros. & Co., York, Pa.
New Jersey Wheel Co., Trenton, N. J.
New Wapakoneta Wheel Co., Wapakoneta, O.
Owensboro (Ky.) Wheel Co.
Parry Mfg. Co., Indianapolis, Ind.
Pontiac (Mich.) Wheel Co.
Rover Wheel Co., Cincinnati, O.
Salsbury Wheel & Mfg. Co., Jamestown, N. Y.
Schwarz Wheel Co., Philadelphia, Pa.
Shortsville Wheel Co., Shortsville, N. Y.
Standard Wheel Co., Terre Haute, Ind.
Stevens & Co., A. E., Portland, Maine.
Stinson, Edw., Mfg. Co., Baltimore, Md.
Union City (Ind.) Wheel Co.
Wayne Wheel Co., Newark, N. Y.
Wilmington (Del.) Wheel Mfg. Co.
Zwick & Greenwald Wheel Co., Dayton, O.

WHIP SOCKETS

Eastern Brass Co., Lynn, Mass.
Scott Co., E. W., Danielson, Ct.
Searles Mfg. Co., Newark, N. J.

WOOD STOCK

Bent Work, Etc.
For Carriages, Wagons and Automobiles

American Veneer Co., Kenilworth, N. J.
Anchor Bending Wks., Reading, Pa.
Brown, S. N. & Co., Dayton, O.

Baltimore (Md.) Hub, Wheel & Mfg. Co.
Buckeye Handle, Gear & Bending Co., Alliance, O.
Campbell & Dann Mfg. Co., Tullahoma, Tenn.
Cartier Sons, Co., A. E., Ludington, Mich.
Crane & MacMahon, New York
Cooper Carriage Woodwork Co., St. Louis, Mo.
Dann Bros. & Co., New Haven, Conn.
Delphos Hoop Co., Delphos, O.
Downey Bros., Lancaster, Pa.
Empire Bending Works, Lancaster, Pa.
Eureka Bending & Wheel Wks., York, Pa.
Gifford & Son, John A., New York City
Holt Bros. Mfg. Co., Concord, N. H.
Hoof, J. C., Co., Chicago, Ill.
Koller & Co., J. B., Mechanicsburg, Pa.
Lebzeiter & Son Co., P., Lancaster, Pa.
Leippe's Sons, Jacob A., Reading, Pa.
Millikan, G. W., Muncie, Ind.
Parry Mfg. Co., Indianapolis, Ind.
Shepard & Sons, H. G., New Haven Conn.
Skinner Bending Co., J. M., Toledo, O.
Smith & Co., Ervin, York, Pa.
Southern Wheel Stock Co., Iron-ton, O.
Stinson Mfg. Co., E., Baltimore, Md.
Tucker Woodwork Co., Sidney, Ohio.
Von Behren Mfg. Co., Evansville, Ind.
Woodman, J. H., Hoboken, N. J.

WHEELS (Steel)

Standard Wheel Co., Toledo, O.

WHIFFLETREES

Single, Double, Triple

Diamond Forging & Mfg. Co., Pittsburg, Pa.

WHITE LEAD

Eagle White Lead Co., Cincinnati, O.
Sherwin-Williams Co., Cleveland, O.

WIND SHIELDS

For Automobiles

Banker Wind Shield Co., Pittsburg, Pa.
Kimball & Co., C. P., Chicago.
National Auto Top Co., New York City
Novelty Mfg. Co., Waterbury, Conn.
Smith & Co., J. N., Detroit, Mich.
Springfield (Mass.) Harness Co.
Troy Carriage Sun Shade Co., Troy, O.

WIRE WHEELS

Mott Wheel Works, Utica, N. Y.
Weston & Mott, Flint, Mich.

WOOD WOOL

Michigan Veneer Co., Alpena, Mich.

WOODWORKING MACHINERY

Badger State Machine Co., Janesville, Wis.
Barnes, W. F. & John Co., Rockford, Ill.
Bentel-Margendant Co., Hamilton, O.
Bicknell Mfg. & Supply Co., Janesville, Wis.
Cordesman-Rechtin Co., Cincinnati, O.
Crescent Machine Co., Leetonia, Ohio.
Defiance Machine Works, Defiance, O.
Empire Machine Works, Mt. Morris, N. Y.
Fay, J. A., & Egan Co., Cincinnati, O.
Hermance Machine Co., Williamsport, Pa.
Pettingell Machine Co., Amesbury, Mass.
Root Co., B. M., York, Pa.
Silver Mfg. Co., Salem, O.

SO-CALLED EARLY SLOW COACHES.

Much has been written about the slow coaches of early days in American travel, but the meagre annals of the road in this country are strangely silent as to some staging records of a century ago which rank with anything in the later days of amateur four-in-hand driving. In the first volume of the *American Farmer*, published in 1819, by John S. Skinner, there is to be found the record of a run from New York to Philadelphia and return which seems to surpass even the speed of the memorable Hyde-Vanderbilt trip of 1901.

A circumstantial account is given of a trip made by the "Post Chaise Line" in eight hours and forty minutes. The route was by way of Staten Island, and the stage left New York at a quarter past two o'clock in the morning, delivering the morning newspapers of the same day in Philadelphia at five minutes before eleven o'clock. "The passengers dined at Renshaw's elegant hotel," so runs the story, "and having transacted their business returned in the same line to New York, where they intended taking an early supper."

Still more "wonderful expedition" by the "Citizens' Post Coach Line" was reported in the same year in the same paper, which was the first publication in America devoted to either agriculture or horse racing and breeding. The rival coach went through by daylight in seven hours and fifty-five minutes, leaving New York at five o'clock in the morning and arriving at Judd's Hotel, in Philadelphia, at five minutes before one o'clock in the afternoon.

In another issue of this pioneer sporting periodical it is stated that the "citizens" coach, then newly established, made the trip to Philadelphia regularly in less than nine hours.

"It leaves Powle's Hook at five o'clock A. M., and arrives at Philadelphia at forty minutes past one, making eight hours and forty minutes between the two cities, so that news contained in the New York morning papers may be found in Philadelphia afternoon ones—or, if there was a return line, a passenger might leave New York in the morning, transact business for one hour and a half in Philadelphia and return to New York to sleep by eleven o'clock at night, having traveled more than 200 miles. Talk of European improvements and expedition; there is nothing equal to this in the world."

These old-time staging performances, which had been forgotten until they were rediscovered will be something of a revelation to four-in-hand men, who have regarded the round trip made by James Hazen Hyde and Alfred G. Vanderbilt to Philadelphia and return in a day as a feat which stood alone in American coaching annals.

This memorable run was made on October 9, 1901, and the official time card, which has been preserved by Morris E. Howlett, the professional whip in charge, shows that the coach left the Holland House, at Fifth avenue and Thirtieth street, at five minutes before six o'clock in the morning. The Bellevue Hotel, at Broad and Chestnut streets, Philadelphia, was reached at twenty-one minutes past three o'clock in the afternoon, and the start for the return trip was made six minutes later. The coach was back at the Holland House at thirty-six minutes past one o'clock in the morning, the round trip having thus been made in nineteen hours and thirty-five minutes.

The time from New York to Philadelphia was nine hours and twenty-six minutes, while the return trip required ten hours and nine minutes. The actual running time, exclusive of stops to change horses was 8:15:30 going over and 9:00:00 coming back, or an average of 11.27 miles an hour.

The time was certified by W. C. Gulliver, then vice-president of the Coaching Club, and by Frederick M. Davies, now treasurer of the National Horse Show Association. Mr. Howlett certified to the reading of the odometer before and after the trip, and Brewster & Co., in turn, certified that the distance traveled according to this reading was 224 miles.

It will be noted that the Hyde-Vanderbilt coach traveled a considerably greater distance than the old stage coaches of 1819,

but its time was beaten by such a margin that the earlier record is apparently still the best one.

The coach of the period of 1819 was a very different vehicle from the typical English road coach on which Messrs. Hyde, Vanderbilt and Howlett made their memorable run. The American stage coach of ninety years ago had an egg-shaped, or oval body, suspended on thick leather thoroughbraces, after the fashion of the famous Concord coach of a later period. It carried nine passengers on three inside seats and was of lighter and less rigid build throughout than the road coach of to-day.

Stage coaches began to run regularly between New York and Philadelphia about one hundred and fifty years ago. The first of these were mere covered wagons without springs, and they were supplemented by boats, which conveyed the passengers from Amboy to this city. The trip in 1759 required three days.

When Thomas Twining visited America in 1805, he made the journey from Philadelphia through to New York by "stage wagon," which he describes as a long car, with four benches, "having no backs to support and relieve us during a rough and fatiguing journey over a newly and ill-made road." The trip was then made in a little more than a day and a half, the stage running all night.

Development of the coach and improvement in the roads, following the introduction of springs, about one hundred years ago, resulted in a wonderful acceleration of speed in traveling in the eastern part of the United States. There was great rivalry among proprietors and drivers, particularly on the National road, from Cumberland to Wheeling. The regular mail coaches made the run of one hundred and thirty-two miles over this macadamized turnpike in twenty-four hours, but the test of mettle in men and horses came when the President's message was to be delivered. On one occasion "Dan" Noble was said to have driven from Wheeling to Hagerstown, one hundred and eighty-five miles, in fifteen hours and thirty minutes.

It is to be regretted that the story of early American coaching was never written or preserved.

HOW OFTEN SHALL HORSES BE FED?

Recently there has been quite an agitation in Seattle over the decision of a prominent transfer company to discontinue the noon-day meal of their horses. This decision has brought forth a storm of protest from the drivers, which ended in a general strike of all the teamsters employed by the company.

The subject of how often and how much working horses should be fed is an old one, and one on which there is no end of opinions. Nearly all concerns using a large number of teams have their own system of feeding, with rarely any two alike. That many working horses are overfed most of us know, and that many are underfed none will doubt who will stand on the street corners for a short time and watch the passing teams. The system and the amount fed should, as a rule, be determined by the kind of work the horse is doing and the length of time he is allowed after eating to digest his food before resuming work. Horses working eight or ten hours a day are certainly entitled to a midday feed and should have it providing it is not too heavy, and they should have half an hour or more rest after eating. Horses should always be watered before feeding and never immediately after. It is more injurious to digestion, and is often the cause of colic to allow a horse to drink heavily on a full stomach of grain.—Horseshoers' Journal.

NEW HUB PLANT FOR SAGINAW.

William Cutler, for 12 years timber buyer for the Imperial Wheel Works, of Flint, Mich., and his son, E. L. Carter, for twelve years in charge of supply depots for the Imperial Wheel Works in Tennessee and at Pine Bluff, Ark., are preparing to open in Saginaw a plant for the manufacture of wooden hubs for vehicles.

STRONG MEN IN THE TRADE.



W. H. BROWN

W. H. Brown is at present the active head and president of the Mais Motor Truck Co., of Indianapolis, Ind. Mr. Brown's activities have been divergent and various, making him known in a wide circle of trade.



J. A. POSTE.

Mr. Poste is known very generally as "Bob," owing to his geniality and friendliness of demeanor. He has been identified with the Columbus Bolt Works at Columbus, Ohio, for at least twenty years, and is the boss of the sales department.



CARL P. SCHLAMP.

Mr. Schlamp is now a vice-president of the C. B. N. A., which honor was bestowed at the late convention. His daily energy is expended in behalf of the Geo. Delker Co., of Henderson, Ky., whose buggies are known and used far and wide, owing not a little to Mr. Schlamp's energy and business sagacity.



CHARLES E. ADAMS.

Mr. Adams is the president of the Cleveland Hardware Co. in Cleveland, Ohio. Mr. Adams has built a reputation as one of the ablest men in his department of business endeavor, and we understand he is pleased to have the company he controls stand as his monument.

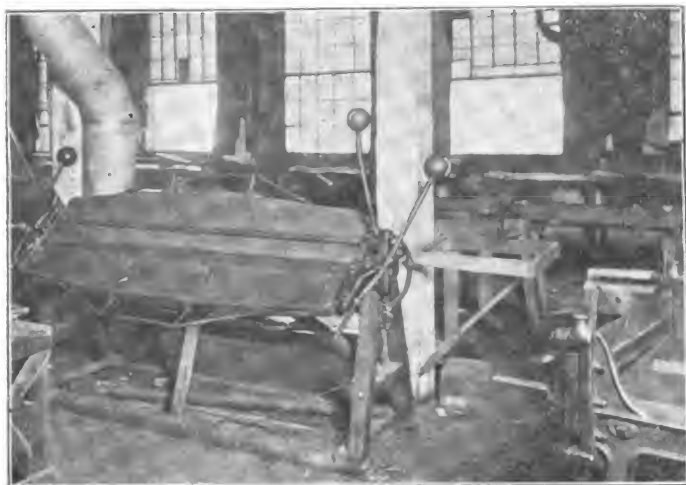
Special Machinery Equipment of Leading Automobile Body Shops.

A review of the growth of the metal body business for automobiles takes one to Amesbury, Mass., where the work was first done in a small way by hand. The increased demand called for machinery and change in method of manufacturing from hand work to machinery designed and built for this special line of work to supply the demands for aluminum and sheet metal bodies. The credit for encouraging, assisting and developing the metal body should be largely given to the Pettingell Machine Co., of Amesbury, Mass., the home of the industry, as we find the management has from the beginning persistently worked and kept experts in touch with workmen in the various shops to develop and build machinery for the various parts of the work and encouraged and advised the various body manu-

The company is continually adding to its standard line of machinery any machines or equipment which prove practical and useful after thoroughly trying out on actual work.

The old-time carriage and body factories of Amesbury, which formerly set the style and standard for quality and work for the world, are all rushed on orders for metal bodies for high grade automobiles and all are using Pettingell machinery which has enabled them to maintain their reputation of making the best bodies in the world.

Manufacturers in other cities, alive to the progress of the Amesbury manufacturers, and the possibilities of their metal



Sheet Bending Machine.

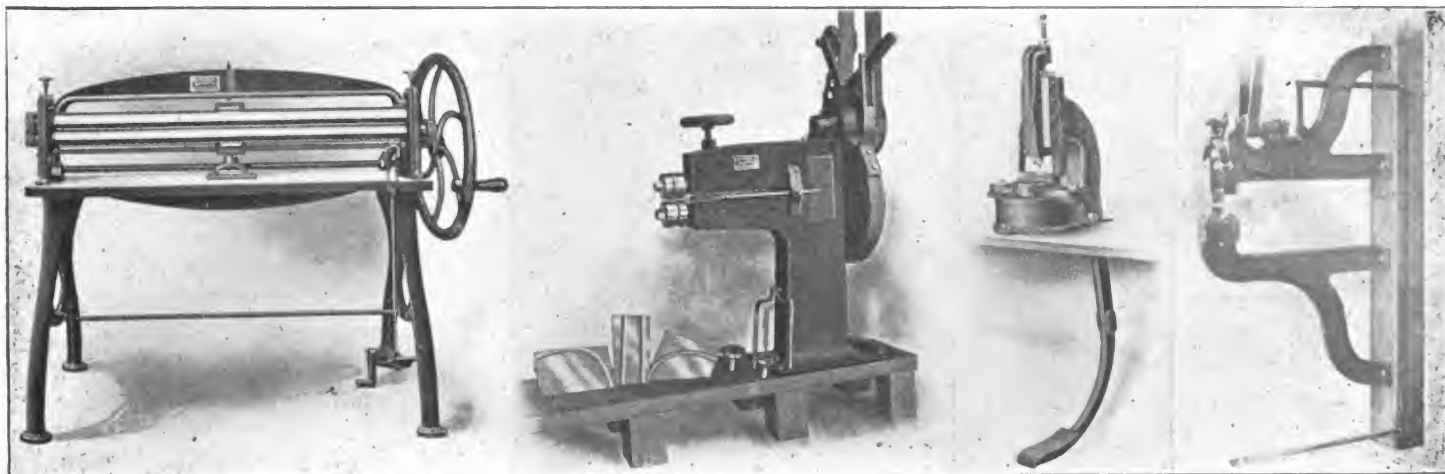
facturers to add metal body machinery to their line and be prepared for their share of the enormous business which would surely develop.

The cost of extra special machines needed to enable the manufacturers to make both wood and metal bodies is small comparatively, with the field for the work. This company has built many special machines for various factories and builders, and has also developed a standard line of machines for metal body business that are now recognized and endorsed the world over and are in use in all the principal factories in America, as well as in England, Germany, Australia, Canada, and Italy, and are rapidly being installed by many other factories as they see the trend of business towards metal bodies.



Running Beading or Moulding Around Automobile Body.

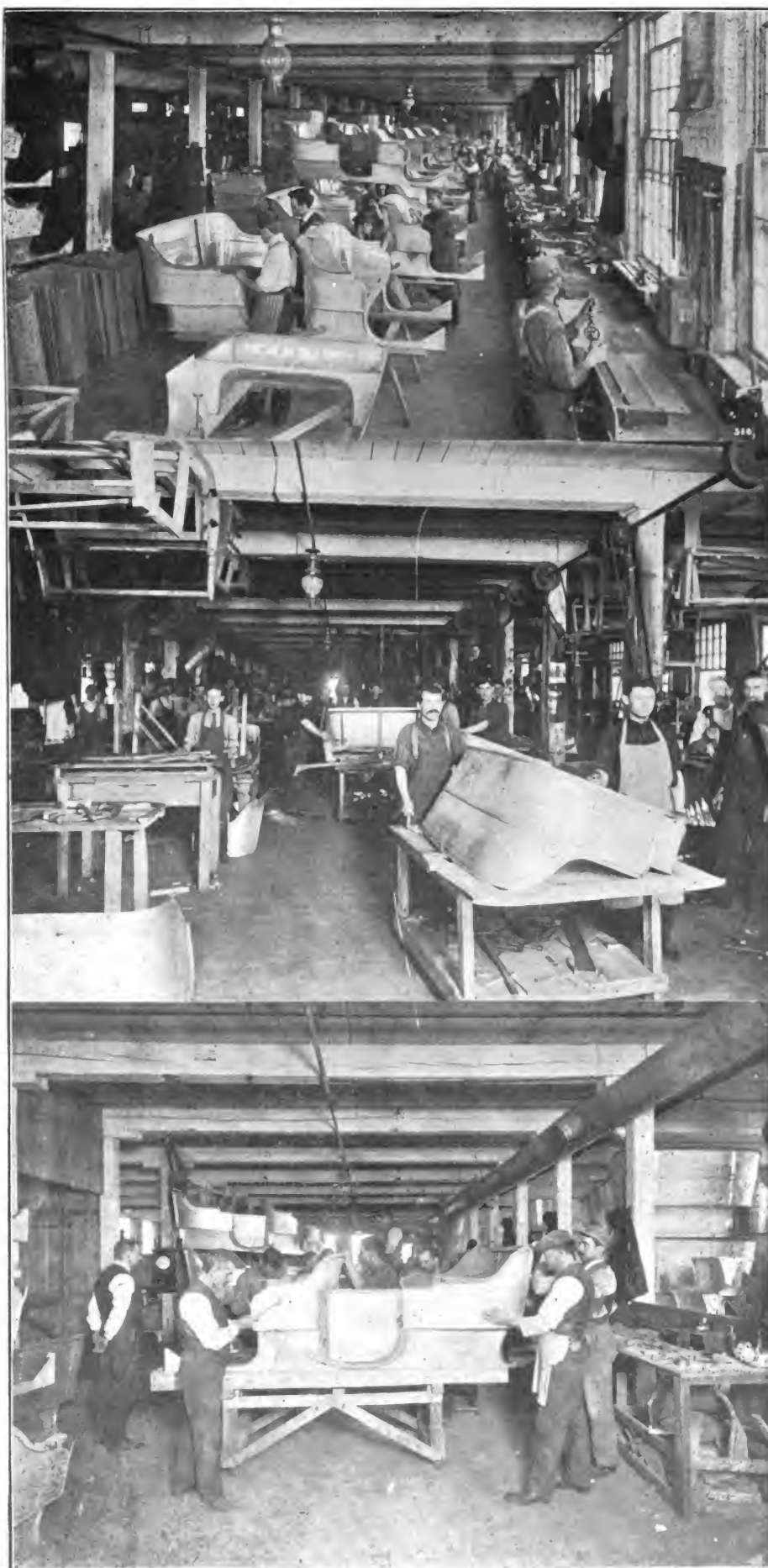
body work, have ordered and installed large numbers of the Pettingell machines in their factories. In Detroit, which is rapidly forging to the front as the largest automobile center in the world, the manufacturers have discarded many of their old machines and installed large numbers of the various Pettingell patented lines. In one factory alone (the Fisher Body Co.) they have seventeen Pettingell automatic power hammers, large and small, for various kinds of work, and a full equipment of bending machines, metal cutting machines, rolling machines and punches, also five Pettingell patented saw tenoners as well



Improved Metal Roller Former.

Power Moulding or Beading Former Kick or Foot Press and Metal Cutter.

Automatic Power Hammer



Scraping Automobile Bodies.

as bevel and mitre saws, irregular dressers, etc., and claim they can find no other machines to compare with the Pettingell line for the quality and quantity of work.

The frame of the automatic power hammers is of special design to give plenty of room to handle and form body and seat panels, backs, etc., in working. The machines are usually set up high enough to allow room between the floor and the anvil frame to turn or swing a full back panel when working and the operator stands on a small wood platform and controls the machine with his feet.

Some of the best operators in the country were formerly body makers and blacksmiths and helpers in the carriage factories. Some mechanics bring out their work from these hammers so smooth that it requires scarcely any sanding.

Moulding or beading of various shapes is made in the sheets of metal at the various factories with Pettingell beading machines. Various sizes are found in different factories run by both hand and power. The company also makes tools for these various machines for turning over flanges and edges of metal, folding in wire, etc., which are of great help in factories doing such work.

Foot presses for punching solid mouldings; and rolling machines made in various sizes by the Pettingell Machine Co. are also used in the leading factories.

A glance over the catalog of the Pettingell Co. and a general survey of exacting conditions pertaining to the sheet metal body industry indicates a bright future for this particular department of carriage and automobile construction, almost unlimited as regards body lines and embellishments; in fact, metal bodies are just beginning, and it is needless to state the Pettingell concern will keep pace with the needs and requirements of the trade, rather, we should say, anticipate the wants.

Little did the lumber barons realize the healthy infant they were fostering when wood material began to get so very scarce that exorbitant prices were demanded. The Pettingell Co. surely were trust busters in the commonly accepted sense.

The Pettingell Machine Co. will be pleased to hear from any one contemplating the manufacture of metal bodies, and will give valuable information as to machinery requirements and assures the trade that it can supply the best machines for the work as well as saving money on the equipment. It is also prepared to give many helpful ideas in regard to advanced machines, tools, etc., working the metal and in getting out body stock. The company claims that Pettingell machines cost less to buy and operate than any other machines which are not adapted to the work and that will not give the production either in quality or quantity.

NEWS OF THE AUTO TRADE.

Pueblo, Col., is to have an auto factory. The Byron Motor Company, of Denver, announces that they have taken over the plant of the old Pueblo Steel Wheel and Wagon Company and will at once begin the installation of machinery for the manufacture of the Byron motor truck.

A movement is on foot to establish an automobile factory in Fort Scott, Ark. The plans at the present time are for a \$50,000 company.

It is announced that the Mitchell-Lewis Motor Company has secured a loan of \$2,500,000 from Chicago and New York banking houses. The purpose is to refund all of their banking obligations and to arrange for a sufficient additional working capital to build auto tops, bodies and commercial trucks.

The Sandusky (O.) Auto Parts and Motor Truck Co. has increased its capital from \$150,000 to \$500,000.

New Incorporations.

Toledo, O.—Moore Motor Truck Co., capital, \$10,000, by D. W. Bliss, M. M. Bliss, E. L. Skidmore, C. H. Rauch, F. E. Moore.

Chicago, Ill.—Stevens Motor Truck Co., capital \$10,000, by Henry P. Chandler, J. M. Johnston, K. Cornwall.

Southampton, N. Y.—Walter Motor Truck Co., to manufacture and repair automobiles, capital \$100,000, by E. L. Walter, New York City, C. W. Fletcher, Englewood, N. J.

Mt. Vernon, N. Y.—Meteor Automobile Co., mfg., motors, motor vehicles, etc., capital \$50,000, by Frank A. Kately, 11 Wallace avenue, A. F. Goscheidt, 154 Cottage avenue.

Worcester, Mass., Acme Motor Co., automobiles, capital \$40,000, by president, W. Vincent, W. D. Wheeler, Worcester.

Chicago, Ill.—Stevens Motor Truck Co., capital \$250,000, by G. P. Stevens, L. F. Stevens.

Pittsburg, Pa.—The Krupp Motors Co., capital \$250,000, by G. H. Anderson, James McMorran.

Camden, N. J.—Suburban Truck Co., to manufacture automobiles, etc., capital \$10,000, by Geo. H. Jacobs, Walter R. Carroll.

New York—Wishart-Dayton Auto Truck Co., capital \$25,000, by S. E. Wishart, J. B. Smith.

New York—Bonford Mfg. Co., to manufacture and sell motor vehicles, etc., capital \$25,000, by Geo. Brauburger, 1026 Lafayette street, Elizabeth, N. J.; E. J. Kleinfeld, New York City.

New York—Mogul Motor Truck Company, \$125,000; motor vehicles; George Griffith, L. S. James, Frank Dawson, John P. Hicks.

DIET AND FOOD OF HORSES IN RUSSIA.

Oats constitute three-fourths of the food upon which the Russian horse must exist during the twelve months of the year. Russian oats are far superior in sustaining power to the American cereal. It is also claimed that animals do not become so tired of this steady diet as they do of the hay and corn products in the United States. This statement is made by an American with 18 years' experience in horse breeding and training in Russia.

Among the upper classes 12 or 14 pounds of hay are fed daily to the carriage and race horses, in addition to the 20 quarts of oats that are thought necessary for a horse during the 24 hours. This hay consists principally of timothy in Finland and the central and southern portions of Russia. In many other sections owners of horses must be content with the native marsh grass, which resembles the American prairie grasses. On the uplands, however, a good quality of grass is grown which resembles Kentucky blue grass.

The peasant feeds the marsh grasses to his own stock and sells the better grades of the uplands, so that his horses are fed upon the inferior hay, although regular rations of oats are provided, if possible. In the cities the ordinary draft horses are fed upon a diet similar to that fed by the peasants, with perhaps less hay. Nose bags are used.

As a result of a light hay diet, Russian horses are remarkably free from the heaves, though a more serious trouble originates from a continuous diet of oats; namely, cracked skins and heels, with open sores.

City horses never taste a spear of green grass, but appear to keep in fairly good condition with practically no attention from the grooms. They occasionally are fed carrots, but this does not apply to the average work horse, driven at all times of day and night and subjected to Russian winters. His endurance is one of the marvels of the country.

The feeding of corn, mixed foods, or prepared diets is unknown in Russia except among the racing fraternity, who have adopted American ideas from the trainers brought over years ago from the United States.

NEW DEAL

A deal has been consummated wherein the controlling interest in the Colby Motor Company has changed hands. New officers were elected as follows: President, J. E. Burmeister; vice-president, Wm. M. Colby; treasurer, H. S. Murphy; secretary, increased, and that the line of trucks will rapidly be completed W. N. Smith; general manager, D. W. Henry. Under the new management it is expected that the output of the factory will be and put on the market.

DURANT HONORED AT "WIZARD'S BANQUET."

W. C. Durant, Flint, Mich., was the guest of honor at what was denominated "The Wizard's Banquet," which was tendered him by the business men of that city on the 28th inst. Several of his associates were among the many who paid tribute to the bundle of energy who certainly did things in a way that made the automobile industry "take notice."



Pettingell Automatic Hammer Working on Automobile Body
(See preceding pages.)

CRESCENT BODY WORKS.

S. P. Gehret, of Reading, Pa., is the proprietor, and he is one who comes from a coach body building family, so when the announcement is given out by Mr. Gehret that he is ready to make and deliver bodies for vehicle work, either auto or horse-drawn, metal or wood, as wanted, buyers can be sure of having specifications intelligently followed as Mr. Gehret does his own



S. P. GEHRET.

drafting and designing, then follows the work through all its processes. For fifteen years he has been at it and his experience has taught him to pick only well skilled men to work under him. In addition to work from specifications, he turns out his own regular lines. His work is delivered ready for trimming and painting. That it is appreciated is shown by the number, extent of orders, and quality of firms ordering, some relying upon him for their entire output.

THE SILENT TRAVELER.

Roehm & Davison, Detroit, Mich., have increased their sales force. Another drummer has been added to the ranks of their angels of commerce. There is to be a decided exception to the other advance agents of prosperity which is "The Silent Traveler." Think of it! It is a periodical that is not to be a periodical, taking Roehm & Davison's statement for it, for they say it is to be published when they have the desire and price. Some of the contents of this interesting edition have been in stock quite a while but we assure the readers that the same rule does not apply to the bright fresh goods that Roehm & Davison offer to the trade. Generally speaking, however, the booklet is interesting, well prepared and will accomplish its purpose, i.e., a gentle reminder that Roehm & Davison, Detroit, Mich., want you to ask for prices on leather carpets, buckram, etc. The subscription price is your name and address.

GREAT LITTLE PEOPLE.

Boub & Scheu, of Cincinnati, are so well known that the name is an introduction. Their horse or power vehicle tops, trimmings, and especially their patent anti-creepers for preventing the creeping habit of hard rubber tires on vehicle wheels, stand out as especially serviceable and good value. We don't mention the line of finished work, but it is important. Then in machinery there is a bow dressing machine that is mighty convenient. Fact it, this Cincinnati concern comes close to being an all round place to deal in, even for horse and harness specialties.

APPLEBERRY LOCK NUT AND THREADLESS VEHICLE SPINDLE.

These devices are now complete and ready to market, being manufactured by Appleberry & Welch, Cincinnati, O. The device will apply to any vehicle and can be operated by the use of nippers, and de-wheel a whole vehicle in less time than it takes to remove one wheel in the old fashioned way. The threads on the old thread spindle can be removed from them and this device applied to them. Country shops doing vehicle repair work can readily remove the threads from the old fashioned axles and apply the device.

GOODRICH PACIFIC COAST ROUTE BOOK.

The B. F. Goodrich Company, of Akron, O., has just issued a route book of Southern California. It is the first of a series of eight books, which will include all the routes now being marked with Goodrich road markers on the Pacific Coast.

The general plan is somewhat different from that of the previous books published by this company. Instead of having one large map which is often inconvenient to handle while touring, the territory has been divided into sections. The map of each section is on a separate page with route description opposite. An index map is provided which gives a general view of all the territory included in this book and enables one to locate quickly the particular road maps he wishes to consult. In addition, city maps are furnished wherever needed, although the scale and design of the road map is such as to make these seldom necessary.

BICKNELL HELVE HAMMER.

The Bicknell Helve Hammer shown on this page is made on entirely different lines from ordinary hammers. Its simplicity appeals to every one. It has less parts than other hammers, will work on thick or thin material without change, requires but



little power to operate and takes a floor space of only 24x70 inches. This hammer is manufactured by the Bicknell Mfg. & Supply Co., of Janesville, Wis., who manufacture a line of hammers, punches and shears, felloe rounders, sanders, jointers and special machines. A catalogue of their complete line will be mailed on application.

"KEYSTONE" BODIES.

Steel buggy bodies are very much in evidence at present. There are many technical points of excellence that the builder has considered most favorably. The idea and the work is new for buggy work, so it becomes necessary to look for a good product to those whose experience is the ripest. We think a reference to the Keystone Sheet Metal Company, at Ambridge, Pa., is desirable in this connection. They are skilled workers in metal, know its peculiarities, so they can make it do what is expected of it by the buggy builder. Their catalogue tells an interesting story that the builder should read.

NEWS ITEM FROM THE STUDEBAKER CORPORATION, SOUTH BEND, IND.

The Studebaker line for 1912 is creating widespread interest. The many new and exclusive features which have been added, the large assortment of styles, and the increased facilities for making prompt shipments, have created more than favorable comment.

During the past few weeks, the complete line has been reviewed by nearly all of the branch house salesmen. They are most enthusiastic for a big buggy year. The consensus of opin-



Studebaker "Live Wires."

ion is, that with such an up-to-date line, and such a variety of exclusive features, and its completeness, it must be recognized as the strongest buggy line of the year.

We are showing with this article, views of the traveling salesmen's force of their Denver, Minneapolis and Kansas City branches. These were taken at the factory of the Studebaker Corporation.

SALE OF COLUMBIA CARRIAGE FACTORY.

The plant of the Columbia Carriage Company, Hamilton, O., including real estate, buildings, machinery and merchandise, also the merchandise in the plants of the carriage woodwork company, at Hamilton, O., were sold at auction December 6, for \$42,000 to O. M. Bake. Mr. Bake holds many of the outstanding accounts against the company. The plant will continue to be operated. The appraisal of the plant was over \$200,000. The sale of the plant to Mr. Bake means the incorporation of a new company, which will continue operation of the plant.

YOUR WORST COMPETITOR.

It's not the man who only undersells you who is your worst competitor. Nor is it the man who only underbuys you. The man to fear is the man who uses brains, energy and system and keeps things moving all the time. The man who keeps his business eyes riveted on his business every minute of every business day is the only real competitor.

LIQUID DRESSING.

Indigo, 120 grains; tragacanth, 120 grains; glue, 4 ounces; logwood, 8 ounces; glycerin, 3 ounces; water, 1 pint; diluted acetic acid, 2 pints. Boil together and strain.

ANOTHER ST. LOUIS EXPOSITION.

Harry G. Oyler, who was superintendent of the vehicle and implement department of the old St. Louis fair grounds, has been engaged to conduct the same department for the Universal Exposition to be held at St. Louis. He will begin work at once and will prepare for a big show next fall. The promoters of the exposition plan to make it a bigger event than any since the Louisiana Purchase Exposition. Invitations will be sent to all the manufacturers in the West to place their wagons and implements on exhibition. The vehicle and implement manufacturers are co-operating with the Universal Exposition Company, and it is likely they will exhibit their 1913 models at the fair, which will last three months.

THE MID-WEST DEALERS.

Omaha was chosen by the mid-west implement dealers as their meeting place for 1912. The dates for the convention will be November 12, 13 and 14. At the election of officers, Paul Herpolsheimer, of Seward, was re-elected president; M. L. Goosman, of Vesta, Neb., was re-elected secretary, G. A. Wagner, of Omaha, was elected treasurer; Oscar Rysstrum, of Strongsbury, and Mr. Wapples, of Castine, Ia., were chosen directors for three years.

The resolutions drawn up by the convention were passed by the board of directors. The resolutions favored the improvement of state highways by convict labor, opposition to the parcels post bill and the introduction of the penny post.

THE "SCRANTON" FIRE.

An explanation of the recent fire in the Scranton Axle & Spring Co., will be found interesting. It is from Mr. O. C. Hall, of the company: "We had been moving from the old plant and had nearly everything out except the goods in the storeroom, which were being shipped on orders and a few machines together with the boilers and engines and in view of the moving had cancelled nearly all of our insurance policy on that plant. We had no insurance whatever on the stock. However, it will not interfere with our business in any way and we shall survive the shock without very much difficulty."

KENTUCKY WAGON MAKERS ADD ELECTRICS

The Kentucky Wagon Mfg. Co., of Louisville, Ky., of which W. C. Nones is president, has taken over the business of the Electric Vehicle Co., which was started in that city several months ago and which produced only a few electrics. The Wagon company will continue the manufacture of the electric vehicles, devoting its first attention to wagons and later to pleasure cars, but without in any way curtailing its production of horse-drawn wagons.

M. A. M. FIXES DATE FOR ANNUAL BANQUET.

The annual banquet of the Motor and Accessory Manufacturers has been fixed to occur on Tuesday, January 9. It will be held in the Waldorf-Astoria. The annual meeting and election of the organization will occur the day before, also at the Waldorf.

STUDEBAKER ADOPTS CREDIT PLAN.

Announcement is made by the Studebaker Corporation that henceforth it will accept notes from responsible buyers in payment for its E-M-F and Flanders cars protected by leases and insurance.

NEW SALES MANAGER FOR PARRY.

E. H. Habig, the new sales manager for the Parry Mfg. Co., of Indianapolis, Ind., has been connected with that firm for twenty-three years and his recent promotion is a result of close attention and application during his long period of service in connection with the vehicle business. Close contact with the varying vicissitudes of the carriage industry covering almost a



E. H. Habig.

quarter of a century has left with him an enthusiastic confidence in the future of moderate priced horse-drawn vehicles.

He recently returned to the office from an extended trip covering southwestern, western and northwestern territory, where he found conditions for 1912 business very flattering.

Harry W. Draggio, advertising manager for Parry Manufacturing Company, will conduct a class in advertising in the Indianapolis Y. M. C. A. during the coming winter. This is one of the newest lines to be taken up in Y. M. C. A. night classes and Indianapolis is one of the forerunners in the movement.

THE "SPRING BELT."

This is an auto robe that clasps around the body with an inch wide spring resilient enough to adjust to all proportions of girth. It also has "feet" to snuggle the wearer's shoes, so he has full play of his extremities for working the machine. The body is protected high up, and altogether this is a distinct advance in protection that merits approval. It is made by Chicago Auto-Robe Supply Co.

GOOD LUCK TO DOHERTY.

Mr. P. R. Doherty, who scored so cleverly in his paper at the carriage convention, is now interested in the R-D Motor Parts Co., Flint, Mich. It is a selling agency for whatever is good in the motor accessories line.

INFORMATION BUREAU.

Markt & Schaefer Co., 193 West St., New York City, have an export order on hand ready to place for $\frac{3}{8}$ in. carriage body poplar, three different widths, 20 in., 26 in., and 36 in. Quote price; at once, freight rates to New York City. Specifications for export shipping will accompany order. All communications should be addressed to Mr. Lohse, So. Am. Department.

Mr. Carl Wiemann, Eiffester 6-8, Hamburg, Germany, is in the market for carriage wood stock, especially dry rock elm hub blocks, $5\frac{1}{2}$ to 7 in. Please write him.

The Storm Queen Buggy Co., Wabash, Ind., would be pleased to receive catalogs, prices, samples, etc., from carriage supply houses.

OBITUARY

Charles S. Caffrey, aged 81, one of the best known manufacturers of sulkies and carriages in the United States, died November 26th at his daughter's home, Camden, N. J. He had been ill for a long time and death was due to a complication of diseases. Mrs. Anna M. Cooper, Camden, N. J., survives. Mr. Caffrey was born in Swedesboro, N. J., January 31, 1831, his father being the carriage and wagon builder of the town. In 1847 the elder Caffrey moved to Camden and conducted the carriage and wagon establishment which Charles, at the early age of nineteen, purchased from him. In 1858 he built his first sulky to order for the celebrated trotter, James K. Polk, and from that time he gave his whole attention to light carriage building and light racing traps. In 1877 his factory was burned, but was rebuilt on a larger scale. The buildings are located at Tenth and Federal streets, Camden. A wareroom was leased at Ninth and Chestnut streets, Philadelphia, and later another factory was operated at Chester and James streets. In 1879 the Chas. S. Caffrey Co. was organized by Mr. Caffrey and the building of all styles of fine heavy carriages was added. In 1885 the ware-rooms at Seventeenth and Chestnut streets were erected. Mr. Caffrey retired from business several years ago.

Frank H. Post, the leading wagon manufacturer of Knoxville, Tennessee, died on Thursday, November 2, 1911. He was born at Metomen, Wisconsin, in 1854. In 1870, when he was fifteen, his father moved to Knoxville, establishing the wagon and carriage manufacturing business. After he finished college, he became associated with his father in the business. Mr. Post continued in the business until the time of his death. He is survived by his wife, two daughters and one son. The business is continued by his remaining partners, one of whom is his son, as Frank H. Post & Company.

Col. J. H. Sprague, head of the Sprague Umbrella Co., well known to the carriage trade, died at his home in Norwalk, O., November 30, after a short illness. Col. Sprague was born in Cayuga County, N. Y., in 1845. His course in college was interrupted by the outbreak of the Civil War. Entering the army, he was rapidly raised in rank until he was mustered out of the service in 1865. In 1886 he began making umbrellas and tops, which business grew steadily. Col. Sprague was a prominent figure in fraternal and patriotic organizations and numbered his friends by hundreds.

Michael Kachelhoffer, a pioneer wagon maker of Freeport, Ill., died November 22, of paralysis, at the home of his daughter, Mrs. Frank Bangasser, at Sioux Falls, S. D., whom he had gone to visit last September.

Frederick Hayes, Sr., aged 94, a well known carriage manufacturer, died November 17, at 85 Virginia avenue, Wheeling, W. Va.

NOT AFFECTED BY MUD OR WATER.

Valentine & Company, the varnish manufacturers, will run an automobile wheel over a wet and muddy road in their booth at each of the automobile shows. The actual roadway is not achieved in the exhibit, but the wheel is hung to revolve with its lower side constantly in a pool of muddy water.

The device will show the remarkable resistance to mud and water of a new varnish for automobile chassis soon to be put on the market by Valentine & Company. This varnish is not affected in the slightest degree by the severe trial it gets at the exhibit, while all the other varnishes soon lose their life and lustre.

The exhibit is a startling one, as the deterioration of the varnishes hitherto used for this purpose, goes on in plain sight, while the new Valentine product goes through the ordeal for weeks at a time and remains as good as new.

Trade News From Near and Far

BUSINESS CHANGES.

Crisman & Conboy have purchased the business of Froemke Bros., in Anselm, N. D.

Waldo & Waldo have purchased the stock of vehicles, etc., of E. A. Ray, in Ankeny, Ia.

James Gunn has disposed of his stock of vehicles in Breda, Ia., to Wm. C. Brinckner.

Johnson & Long have succeeded to the business of J. W. Johnson, in Lamour, S. D.

Henry Stetler has purchased the stock of vehicles, etc., of Fred Rhols, in Oak Hill, Kas.

Thaves & Stelsen have purchased the stock of vehicles, etc., of H. B. Ley, in Germania, Ia.

O. A. Dick has purchased the stock of vehicles and hardware of M. Wayne, in Randolph, Kas.

Hess, Goode & Co. have succeeded to the vehicle business of H. J. Hess in Guthrie Center, Ia.

Benway & Thomas have purchased the stock of vehicles, etc., of Scott & Thomas, in Horton, Kas.

Laverne Woody has purchased the stock of vehicles, etc., of Chas. Magoffin, in Golden City, Mo.

A. Helpenstine has disposed of his stock of vehicles, etc., in Greenfield, Mo., to White & Morris.

C. S. Foraker has moved his stock of vehicles and hardware from Wakita, Okla., to Bronson, Kas.

John Crisler & Co. have purchased the stock of vehicles, etc., of E. Hartel & Co., in Rice Lake, Wis.

Fischer & Service have succeeded A. G. Fisher in the vehicle and implement business in Rosalie, Neb.

W. A. Bischof has succeeded to the stock of vehicles, etc., of Geo. L. Bischof & Sons, in Rockport, Mo.

Wm. Hack has purchased the implement and vehicle business of D. Kammer & Son., in Lost Nation, Ia.

Walthall & Reeves have succeeded J. B. Walthall in the hardware and vehicle business in Gridley, Kas.

E. S. Haner has succeeded to the entire ownership of the Seguin Buggy & Harness Co., in Seguin, Tex.

P. A. Goyer has been succeeded in the vehicle business in Cotulla, Tex., by the Cotulla Mercantile Co.

S. E. Cardon and J. S. Brainerd have purchased the stock of vehicles, etc., of S. K. Brown, in Curtis, Neb.

Randolph (Wis.) Wagon Works moved from Randolph, Dodge County, to Randolph, Columbia County.

Geo. W. Robinson has succeeded to the stock of vehicles, etc., of Robinson & Felton, in Caledonia, Minn.

J. H. McNeil has succeeded to the entire buggy and hardware business of Hartzler & McNeil, in Cedar, Kas.

Culver & Bridge have disposed of their stock of buggies, etc., in Egan, S. D., to Ed. & Otto Miller, of Flandrau, S. D.

W. N. Harpster, of Marshfield, Mo., has purchased the stock of vehicles, etc., of Geo. N. Noller & Sons, in Kingman, Kas.

E. C. Whitten has disposed of his stock of vehicles and hardware in Lawrence, Kas., to E. C. Broem, of Phillipsburg, Kas.

The Korte Mercantile Co., Medical Lake, Wash., has purchased the stock of the Washington Hardware & Carriage Co., of Spokane, Wash.

The Emporia (Kas.) Mfg. Co., is the name of a new company which will manufacture waterproof buggies, the invention of J. F. Kertman, now of Burns, and the patent road grader, a device made by S. O. Hays, of Emporia.

The Wyoming Lubricated Leaf Spring Company is the name of a new corporation that has been organized at Sheridan, Wyo.,

for the purpose of manufacturing the slotted spring for vehicles recently invented by Charles H. Wilcken. The company expects to erect a plant to cost not less than \$75,000.

The Pinnacle Wagon Works, now located at Cumberland Gap, is to be moved to Middleboro, Tenn. The works employ about fifteen people.

The Whitewater, (Wis.) Manufacturing Company will make wagon and harness supplies in accordance with a contract formed with M. K. Jones, of Waukesha, who holds patents on their manufacture.

NEW FIRMS AND INCORPORATIONS.

J. H. Foulk purchased the Greenfield (O.) Carriage Works.

T. L. Clark has just opened a new stock of buggies, etc., in Imogen, Ia.

Kamke & Sons are about to open a stock of vehicles, etc., in Merrill, Wis.

O. B. Willis has opened a stock of vehicles and implements in Vinson, Okla.

W. A. Kennedy is opening a new stock of vehicles, etc., in Estherville, Ia.

J. C. Bilbry is about to establish a hub and spoke factory in Carthage, Tenn.

J. A. Dorf has engaged in the vehicle and implement business in Cuba, Mo.

E. J. Ziebarth has engaged in the vehicle and hardware business in Delano, Minn.

Clarence Reeder is about to open a new stock of buggies, etc., in Fairfield, Neb.

J. C. Wagner has engaged in the vehicle and hardware business in Outlook, Wash.

W. B. Milberry is opening a new stock of vehicles and implements in Royalton, Minn.

Kinyon & Stratton have just engaged in the vehicle and hardware business in Woodville, Neb.

O. D. Dean is about to establish himself in the vehicle and implement business in Adair, Neb.

The North American Vehicle Co. has been organized in Detroit, Mich., with a capital stock of \$10,000.

Russell Burkeau, of Cumberland Gap, Tenn., is about to establish a wagon factory in Middlesboro, Ky.

Chas. A. Robinson has purchased a hardware store in Brunswick, Mo., and will add a stock of buggies, etc.

C. A. Byers is to open a line of vehicles and implements in Mound City, Kas., in time for the spring trade.

C. P. Meyer is about to engage in the vehicle and hardware business in Vale, S. D. Chas. Weldman is manager.

IMPROVEMENTS—EXTENSIONS.

The Iowa Wagon Factory, Sioux Falls, Ia., is erecting a new building.

Rasmussen & Lodke, of Wakondia, S. D., have moved their stock of vehicles, etc., into their new store rooms.

A brick business block is being built at Selma, Cal., with a frontage of 80 feet, for Mr. Vincent's implement and carriage business, and will cost about \$15,000.

Prucha & Son are about to begin the erection of a new building to house their vehicle and automobile business in Wilber, Neb.

The building of the Barmann & Wolfert Carriage and Auto Works, Marysville, Mo., has been put through a thorough re-

modeling that has made a great improvement. The garage and auto repair departments have been moved into the south half of the building.

The Grasberger Vehicle Co., of Richmond, Va., is about to enlarge its plant.

The Farmers' Handy Wagon Company has leased a tract of land adjoining the company's plant which will be used for an extension.

The N. F. Coffey & Sons Manufacturing Company, of Black Rock, Ark., is arranging to establish a wholesale house in Springfield, Mo., to handle finished wagon stock.

The Keller Mfg. Company, Corydon, Ind., has lately enlarged its wagon plant by erecting a fine brick building adjoining the railroad, which will be used for a wheel department.

The Vehicle Top and Supply Co., St. Louis., has moved into new quarters at 3412-14 Lindell street, and is now one of the most complete top, upholstery and body plants in the country.

FIRES.

Fire damaged the Layman Carriage Works at Dayton, Va., loss not given.

Fire destroyed the John W. Little spoke factory at Paducah, Ky., November 12. Loss is about \$10,000.

William Merritt's wagon factory at Salem, Mo., was destroyed by fire.

THE "BATAVIA" AGAIN ON THE JOB.

We are glad to give details of the increase of capital stock of the Batavia Rubber Co., and to state that the always popular A. W. Caney will be strictly in it on solid carriage and motor truck tires. The stock is now \$500,000. In furtherance of the directors' plans options have been secured on a large parcel of land. Full details regarding the plans cannot be arranged until about the middle of January.

Directors elected were Charles R. Rogers and E. E. Carpenter, Ashton W. Caney and John W. Mullen. Officers were elected as follows: Vice-president, Ashton W. Caney; secretary and treasurer, George E. Perrin. The office of president was left vacant, as it is expected that the position will be filled by a prominent New York financier and business man.

Mr. Rogers is a member of the New York firm of Holmes, Rogers & Carpenter, prominent corporation attorneys, and Mr. Carpenter formerly was a manufacturer, now being engaged in dealing in bonds and securities. These men have purchased several blocks of stock in the company, and will take an active part in its management. Mr. Mullen is trustee of the Farmers' Bank and clerk of the Board of Supervisors. Mr. Caney has been with the company since its inception ten years ago and Mr. Perrin has been interested in it several years. It is expected that the directorate will be enlarged later.

It is the intention of the company to use its increased capital for the manufacture of automobile tires and other staple rubber goods and in caring for its increased output. It is the intention to resume at once the manufacture of solid rubber tires. When the company was formed it was for the purpose of making solid rubber tires and in their making it built up a large and profitable business.

During the past year agencies have been established in many of the principal cities and from this source alone enough business comes to keep the factory going at its fullest present capacity.

LOWER FREIGHT RATES ON DASHES.

The McKinnon Dash Co. is trying its utmost, in the interests of the southern carriage trade, to have the southern classification on dashes changed from first class to the rate now current in the "official classification," or second class.

PREMIER BRANCHES OUT INTO TRUCK INDUSTRY.

The Premier Motor Manufacturing Company, of Indianapolis, Ind., has made the announcement that all arrangements have been made to manufacture four-cylinder motor trucks on a large scale. The first of the truck output is now on exhibition at the Premier show rooms and is one of the distinct features of fall opening week.

This truck is of the two-ton class. It can be used as a high class rapid delivery wagon or for heavier work. The new product, which was designed by George A. Weidely, vice-president of the company, is in reality a re-designed Premier motor car. Weidely is one of the foremost designers of the country, and ranks high in his profession, being vice-president of the American Society of Automobile Engineers.

In the new truck the engineering is very similar to that in the Premier motor car, which is simple straight line design. The frame, subframe, shafts, torsion rods, transmission differential, driving pinions and rear axle housing are much heavier and stronger and the drive is through radius rods instead of through the springs.

The brake drums and hubs have been greatly accentuated. The motor car brake, with a surface of 526 inches, has long been celebrated, but the truck brake, with 630 square inches, is said to be the most powerful used in motor car practice. In the rear, double pneumatic Goodrich tires specially constructed, are used. The double tire feature eliminates inconveniences in the event of a puncture or blowout in one tire, as it will not be necessary to stop for repairs in the event of puncture or blowout unless both tires give way. Practically all jarring is also removed by the twin tires. The new truck chassis will be fitted with any body desired.

SHO-FUR MAT ROBE.

The Burlington Blanket Co. has produced an automobile robe made from "Aviator" cloth that has foot and body protecting features that ought to give much comfort. Care has been had in the designing to so adjust the robe as regards the pedals, etc., of the machine, that they can be used freely. It is also interesting that it can't get upside down in use, so must be very sanitary.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word; Initials and figures count as words. Minimum price, 30 cents for each advertisement.

HELP WANTED.

Wanted—First class carriage and automobile painter in an old established shop in town of 6,000 within 30 miles of New York. Send full information. Address Box 102, care The Hub, 24 Murray street, New York City.

Manager Wanted—A man competent to manage the business of a large factory of established reputation making express wagons, both power and horse, may find an opening by writing to P. O. Box No. 2133, Boston, Mass., stating experience and giving references. Amount of salary desired should also be stated.

WANTED

Wanted—A second hand West Tire Setter, medium size. Barbour Buggy Co., South Boston, Va.

FOR SALE.

For Sale—At a bargain, a modern equipped carriage factory. Apply to J. N. Grady, Owensboro, Ky.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

Recently Granted Vehicle Patents

- 985,105—Vehicle Curtain Support. Charles C. Blackmore, Cincinnati.
 984,894—Spring Wheel. Theodore C. Erb, assignor of two-ninths to W. M. Bates, Harrisburg, two-ninths to J. P. Nestor, and two-ninths to J. Reiff, Lykens, Pa.
 984,895—Platform Gear for Vehicles. Joseph Errett, Cleveland, O.
 984,672—Pneumatic Tire. August Hormel, assignor to Hormel Auto Appliance Company, New York, N. Y.
 985,039—Spring Wheel. William I. Kimball, Little Rock, Ark.
 984,833—Demountable Rim. Paul J. McCullough, St. Louis, Mo.
 984,597—Tire. Thomas W. Peet, assignor of one-half to A. F. Johnson, New Britain, Conn.
 985,072—Spring Axle Bearing for Vehicles. John E. Simmons, Portland, Ore.
 985,121—Automobile Wagon Brake. Robert Anliker, Pierre, S. D.
 985,397—Tire for Vehicle Wheels. Lewis A. Coleman, assignor of one-third to H. G. Whitehead, Norfolk, Va.
 985,162—Pneumatic Cushion for Vehicles. Lucien R. Grus, Chico, Cal.
 985,433—Automobile Door Lock. Harry M. Mink, Kenosha, Wis.
 985,298—Vehicle Brake. William Siverd, Geneseo, N. Y.
 985,639—Spring Wheel. Edward Stewart, Kansas City, Mo.
 985,302—Tire. Anthony B. Thoman and P. H. Slamin, assignors to the Empire Tire Company, Trenton, N. J.
 985,884—Anti-skidding Vehicle Wheel. Melville Clark, Chicago, Ill.
 986,049—Puncture Proof Tire. Thomas M. Eynon, Philadelphia, Pa.
 986,278—Draft Equalizer. Milford S. Glover Bighill, Tex.
 986,169—Vehicle Spring. Lawrence Hayes, Monongahela, Pa.
 986,082—Shock Absorbing Device. Luther A. Peckham, Edgewood, R. I.
 986,316—Vehicle Pole. Charles B. Schleicher, Brady, Neb.
 986,227—Means for Propelling Carriages. William D. Seal, Des Arc, Missouri.
 986,670—Vehicle Tire Shoe. Thomas F. Baldwin, New York, N. Y.
 986,904—Shock Absorber. Charles M. Burton, New York, N. Y.
 986,906—Wheel. Chalmers Carpenter, Pittsburg, Pa.
 986,687—Vehicle Wheel. William S. Carroll and J. T. Rowles, Bel-laire, O.
 986,622—Shock Absorber. Ernest F. Ciglia and L. F. Pelletier, New York, N. Y.
 986,691—Vehicle Wheel. Charles Collier, Cleveland, O.
 986,549—Spring Wheel. Guy H. Crawford and G. H. Sauer, Denver.
 986,969—Vehicle Spring. Carlos Escalante and J. P. Sirgado, Merida, Mexico.
 986,913—Wagon Box Bracket. Fred J. Farden, Geneva, O.
 986,704—Attachment for Vehicle Thrills. Thomas E. Gallup, Santa Clara, Cal.
 986,452—Vehicle Wheel. Hugo C. Gibson, New York, N. Y.
 986,563—Resilient Wheel. Robert R. Hage, Culbertson, Mont.
 986,921—Shock Absorber. James M. Jackson, Parkersburg, W. Va.
 986,582—Dumping Wagon. Charles Lynch, Chicago, Ill.
 986,930—Tire. Vincent O. Mervine, Stroudsburg, Pa.
 987,009—Wheel. Vincent O. Mervine, Stroudsburg, Pa.
 986,482—Fifth Wheel. William B. Messink, Worthville, Ky.
 986,948—Resilient Wheel. Edwin S. Shanklin, Oakland, Cal.
 987,090—Wheel Hub. Michael C. Shea, Mishawaka, Ind.
 986,604—Dump Wagon. Rudolph Stuckwisch, Indianapolis, Ind.
 986,885—Wagon Seat. Andrew Wood, Lindale, Tex.
 987,668—Vehicle Tire. Edwin C. Bruen, Brooklyn, N. Y.
 987,334—Tire and Tire Carrying Rim for Wheels of Motor Cars, etc. James S. Clark, London, Eng.
 987,216—Metal Rim for Vehicle Tires. John C. Cole, assignor to The Fisk Rubber Co., Chicopee Falls, Mass.
 987,292—Tire. William D. Furey, assignor of one-half to W. T. Anderson, Norfolk, Va.
 987,621—Self Loading Cart. Norman L. Goodwin, Tacoma, Wash.
 987,328—Adjustable Vehicle Box. Frederick D. Sieman, Menominee, Mich.
 988,161—Draft Equalizer. Henry E. Aastrom, Nicollet, Minn.
 988,085—Resilient Tire. Charles A. Fox, Taft, Cal.
 987,977—Shock Absorber. Phelps M. Freer, Rochester, N. Y., assignor by mesne assignments, to the Connecticut Shock Absorber Co., Meriden, Conn.
 987,713—Sleigh Knee. Gustav H. Genrich, Dorchester, Wis.
 987,724—Wheel Hub. Edward J. Keena and J. W. Kelly, Jackson, Mich.
 987,731—Shock Absorber. Frank A. Lynch, Roanoke, Va.
 987,833—Vehicle Spring. Arthur R. Selden, Rochester, N. Y.
 987,751—Cushion Tire. Augustus W. Shank, assignor of five-sixteenths to A. P. Mott and five-sixteenths to W. W. Tackabury, Detroit, Mich.
 988,045—Cushion Tire. Dexter J. Thayer, Pittsburg, Pa.
 988,229—Automobile Spring. Charles A. Tilt, assignor to J. W. Blackledge, Chicago, Ill.
 988,543—Sectional Wagon Bottom. Melville S. Bowdish, Los Gatos, Cal.
 988,318—Cushion Tire. Charles L. Drake, St. Louis, Mo.
 988,782—Shock Absorber. Thomas O. Huston, Geneva, Neb.
 988,640—Tire for Vehicle Wheels. Edward B. Killen, London, Eng.
 988,475—Tire. William A. Koneman, Chicago, Ill.
 988,722—Demountable Vehicle Rim. Charles B. Lastreto, Oakland, Cal.
 988,884—Fifth Wheel. William J. Martin, Saulsbury, Tenn.
 988,890—Tire Rim. Frank M. Miller and A. F. Steyer, Pontiac, Mich.
 988,500—Vehicle Suspension. Winfield S. Palmer, Glenburn, Pa.
 988,393—Wagon Reach. Jay Spaulding, Yuma, Ariz.
 988,676—Automatic Vehicle Brake. Edgar G. Uhl, San Antonio, Tex.
 988,679—Sled Runner. Adam Wagner, Cedar Falls, Iowa.
 988,680—Wagon Brake. Adam Wagner, Cedar Falls, Iowa.
 988,417—Vehicle Cushioning Device. Peyton West, Springfield, O.
 989,332—Vehicle Tire. Albert P. Burrus, Prescott, Ark.
 989,494—Detachable Wheel Rim. Augustus D. Foucart, Muncy, Pa.
 988,997—Vehicle Tire. John G. Funk, Swisssdale, Pa.
 989,253—Automatic Wagon Brake. Archibald N. Hanna, Fort Wayne, Ind.
 989,431—Vehicle Wheel Tire. Antony T. Scaramuzzi, assignor of one-half to P. Sacco, Paterson, N. J.
 989,407—Shock Absorber Device. Luther A. Peckham, Edgewood, R. I.
 989,961—Wagon Dump. John H. Gilman, assignor to King & Hamilton Co., Ottawa, Ill.
 990,117—Wagon Brake. Henry B. Deakins, Logan, Ia.
 990,197—Side Board for Wagons. Charles M. Haeske, assignor to Studebaker Brothers Manufacturing Company, South Bend, Ind.
 989,906—Wagon Box Clamp. William C. Harp and J. W. Keeney, Millinville, Kas.
 989,617—Vehicle Brake. Harry B. Lester, assignor to The Davis Sewing Machine Co., Dayton, Ohio.
 989,913—Tire Setting Machine. Herbert M. Lourie, Keokuk, Iowa.
 993,332—Vehicle Wheel. Arthur W. Abernathy, Champaign, Ill.
 993,222—Tire Tread. Nahum J. Busby, Boston, Mass.
 992,848—Vehicle Brake. Eason H. Carroll, Clanton, Ala.
 993,035—Fifth Wheel for Vehicles. Sanders Craig, Eagle Station, Ky.
 993,158—Leather Tire. Raymond J. Elledge, Los Angeles, Cal.
 992,778—Wagon Hay Rack. George G. Ketcham, Anamosa, Iowa.
 993,260—End Gate. Gustaf Lindquist, Nisbet, N. D.
 992,785—Double Step for Wagon Bodies. David S. Lloyd, Endeavor, Wis.
 992,796—Armored Tire. George D. Moore and R. L. Morgan, Worcester, Mass.
 993,954—End Gate Fastener for Wagons. Frank Budlong, Ashley Falls, Mass.
 993,141—Thill Coupling. Edward Erickson, Wahpeton, N. D.
 993,995—Tire Setter. Benjamin F. Hobson, Rison, Ark.
 993,379—Shock Absorbing Vehicle Spring. Elmer H. Johnson, New York, N. Y.
 993,865—Safety Wagon Nut. Herman E. Oliver, assignor of one-half to F. W. Jones, Huntington, W. Va.
 994,237—Divisible Rim. Frederic R. Barker, Boston, and J. Greenwood, Walpole, Mass.
 994,247—Removable Tubular Rim. John C. Cole, assignor by mesne assignments, to the Fisk Rubber Company, Chicopee Falls, Mass.
 994,309—Vehicle Tire. John W. Gilliam, Arroya Grande, Cal.
 994,647—Automatic Wagon Brake. Theophilus W. McPeck, Derby, Ind.
 994,486—Draft Equalizer. Frank W. Sutton, North English, Iowa.
 994,546—Vehicle Shock Absorber. Harvey Terhorst, Milwaukee, Wis.
 994,232—Spring Support for Wagon Shafts. Paul W. Zeller, Buffalo.
 994,974—Removable Rim. Eli J. Bushey, New York, N. Y.
 994,828—Locking and Shifting Mechanism for Demountable Wheel Rims. Jay W. Farnoff, assignor of one-half to W. J. Reiman, Buffalo.
 995,344—Vehicle Brake. Levi H. Goodwin, Cincinnati, O.
 995,372—Tire Chain. Alois B. Saliger, New York, N. Y.
 995,208—Wheel Spindle Oiling Device. George Williams, Wilkinsburg, Pa.
 995,995—Shock Absorber for Vehicles. David E. Bennett, assignor of one-third to G. W. Watters and two-thirds to H. McGougan, Rochester, N. Y.
 995,874—Shock Absorber. Hans J. Jorgensen, Chicago, Ill.
 995,608—Wheel Hub and Axle Bearing. Herbert Kintz, Sharpsburg, and J. P. McConnell, Pittsburg, Pa.
 995,688—Vehicle Shaft Forming Apparatus. George A. Lambert, Anderson, Ind.
 995,620—Cushion Tire. George H. Matteson, assignor of one-half to J. M. Hayes, Toledo, O.
 995,906—Thill Coupling. Richard S. Roberts, assignor of one-fourth to J. Sheppard, and one-fourth to G. Sheppard, New Orleans, La.
 995,923—Wagon Body Lining. Tobias L. Steffen, Bluffton, Ind.
 995,738—Vehicle Tire. Johannes Thomsen, Chicago, Ill.
 996,207—Bumper for Vehicles. Colin P. Brown and J. L. Uhlir, assignors to Wentworth Manufacturing Co., Detroit, Mich.
 996,220—Shock Absorber. Thomas G. Cushman, Sunland, Cal.
 996,323—Wagon. Fred Farney, Forrest, Ill.
 996,241—Support for Wheel Rims. Edward V. Hartford, New York.
 996,342—Removable and Adjustable Wagon Side. William H. Jan-vrin, Warrensburg, Ill.
 996,351—Pneumatic Vehicle Tire. Grant Lambright, Newark, N. J.
 996,839—Resilient Tire. Alfred A. Curry, assignor of one-half to E. B. Knowles, and one-twentieth to C. S. Canfield, Bridgeport, Conn.
 996,870—Automobile Rim Holding and Tire Pumping Device. Edward C. McCullough, Greenwich, Conn.
 996,997—Spring Mounting for Vehicles. George W. Morris, Racine, Wis.
 996,730—Dumping Wagon. Wilbur H. Scott, Ottawa, Ontario, Can.
 997,745—Detachable Rim Flange for the Wheels of Motor Cars and Other Vehicles. Thomas E. Bridgeman, Swansea, Eng.
 997,370—Shock Absorber. Louis Chanudet and T. G. Ribis, Neuilly-sur-Seine, France.
 997,273—Vehicle Brake. Thomas A. Coleman, St. Louis, Mo.
 997,443—Pneumatic Tire. Thomas Dunn, London, Eng.
 997,809—Tire Construction. Charles N. Harrison, Westfield, N. J.
 997,837—Pneumatic Tire. Francis A. Mason, Henderson, N. C.
 997,508—Vehicle Body. Thomas Parry and W. J. Byers, assignors to Parry Manufacturing Company, Indianapolis, Ind.
 997,708—Tire. Charles L. Schwarz, Philadelphia, Pa.
 997,861—Bottom Dumping Wagon. Martin L. Sanderling, Jersey City.
 997,470—Vehicle Spring. Arthur L. Snow, Kingfisher, Okla., assignor to G. C. Snow, Comfort, Tex.
 997,877—Tire Carrying Rim for Vehicle Wheels. George Webb, Monmouth, England.
 997,531—Carriage Brake. Frederic W. Wright, Cockeysville, Md.
 998,458—Apparatus for Braking Vehicles. Louis Bolraut, Paris, France.
 998,154—Draft Equalizer. Homer C. Boss, Buffalo, N. Y.
 997,959—Vehicle Brake. Charles E. Brigel, Cincinnati, O.
 998,476—Vehicle Tire. John W. Driscoll, Central City, Col.
 998,366—Tire Chain. Victor Mancini, Granville, N. Y.
 998,127—Tire for Vehicles. Ernest Siegel and M. J. Cantor, assignor of fifty-one one-hundredths to J. Rupert, Jr., twenty-four and one-half one-hundredths to E. Siegel, and twenty-four and one-half one-hundredths to M. J. Cantor, New York.

Copies of above patents may be obtained for fifteen cents each, by addressing John A. Saul, solicitor of patents, Fendall Building, Washington, D. C.

RECENTLY EXPIRED PATENTS OF INTEREST TO THE VEHICLE TRADE.

Patents Expired July 10, 1911.

- 522,631—Sulky. Samuel Toomey, Canal Dover, Ohio.
522,657—Sulky. John P. Faber, Rochester, N. Y.
522,663—Pneumatic Tire. William P. Jaus, Indianapolis, Ind.
522,682—Brake. Francis D. Verran, Republic, Mich.
522,789—Wheel for Vehicles. Charles K. Welch, Coventry, Eng.
522,941—Wheel. Godfried Laube, Huron, S. D.

Patents Expired July 17, 1911.

- 522,962—Extension Piece for Combined Poles and Shafts. Henry Broome, Springfield, O.
522,973—Combined Sleigh and Wagon. Anthony Czora, Charles K. Ernst, Jr., and Charles J. Dernback, Buffalo, N. Y.
522,975-6—Carriage. Charles N. Dennett, Amesbury, Mass.
523,030—Cast Metal Wheel. James Yocom, Philadelphia, Pa.
523,031—Pneumatic Tire. Robert S. Anderson, Toronto, Can.
523,051—Vehicle Wheel. Newton D. Penoyer, Fort Worth, Tex.
523,066—Vehicle Gear. James M. Bromley, Plattsburg, N. Y.
523,108—Clip for Wheels. Charles S. Dikeman, Torrington, Conn.
523,129—Thill Coupling. George N. Pearson, Hantsport, Can.
523,148—Pole and Neck-Yoke Connection for Vehicles. Horace L. Kingsley, Racine, Wis.
523,150—Wheel. William A. Orr and Benjamin S. Reynolds, ton, Pa.
523,179—Transformable Carriage. John E. W. Schuricht, St. Louis.
523,199—Curtain Eyelet for Vehicles. Chilton D. Dickerson, Marquette, Mich.
523,258—Rein-Guard. Charles Allen, Wausa, Neb.

Patents Expired July 24, 1911.

- 523,342—Wheel. Henry S. Ollick, Casey, Ill.
523,480—Vehicle Brake. Daniel L. Miller, Meyersdale, Pa.
523,494—Thill Coupling. William D. Turner, Ferguson's Wharf, Va.
523,506—Spindle for Vehicle Axles. William M. Barnes, Circleville, O.
523,523—Top Box or Rack Attachment for Vehicles. Lawrence H. Hansen, Dahlville, S. D.
523,567—Device for Warming Vehicles. John Broderick, Fulda, Minn.

Patents Expired July 31, 1911.

- 523,769—Rein Holder. David D. Horton, Washington, D. C.
523,835—Buggy Seat. Charles Gussett, Cincinnati, O.

Patents Expired August 7, 1911.

- 524,027—Point Band for Vehicle Hubs. Jared Marls, Cincinnati, O.
524,050—Vehicle Wheel. William Dolg, London, Eng.
524,092—Machine for Making Axles. Camille Mercader, Braddock, Pa.
524,095—Holdback for Vehicles. Samuel F. Robbins, Langhorne, Pa.
524,224—Wheel. Archibald Sharp, London, Eng.

Patents Expired August 14, 1911.

- 524,424—Wheel. William E. Meyer, Charles M. Young and Amos V. Boyce, Columbus, O.
524,570—Vehicle Pole Tip. Edward Bailey, Folkstone, Eng.
524,604—Combined Thill Coupling and Anti Rattler. James B. Newell, Red Wing, Minn.

Patents Expired August 21, 1911.

- 524,701—Carriage Jack. Owen W. Bowen, Albion, Ind.
524,741—Wagon End Gate. Frank F. Varing, Scales Mound, Ill.
524,791—Axle-Box for Wheels. Francis C. W. Rorer, Philadelphia, Pa.
524,822—Tongue Support. Louis Even and John T. Crowe, Jeffriesburg, Mo.
524,826—Carriage Pole. Nathan L. Holmes, Racine, Wis.
524,837—Attachment for Vehicle Poles. Frank Queiszer, Milwaukee.
524,873—Thill Coupling. Cornelius M. Stevens, Pittston, Pa.
524,903—Vehicle Axle. William L. Massengale, Deatsville, Ala.
524,929—Carriage Spring. Charles A. Behlen, Cincinnati, O.

Patents Expired August 28, 1911.

- 525,011—Wheel. Spencer Garwood, Milford Center, O.
525,033—Sulky. Frederick S. Stoddard, Syracuse, N. Y.
525,081—Tire for Wheels. Robert M. Keating, Springfield, Mass.
525,106—Body for Milk Wagons. George B. Marx, New York, N. Y.
525,125—Vehicle Shaft Support. John A. Wheatley and Samuel M. Worthington, Chicago, Ill.
525,218—Carriage Pole Coupling. William J. Kaufman, Miamisburg.
525,257—Vehicle Axle. Cornelius Burns, Burnside, Pa.
525,295—Vehicle Pole. John B. Struble, Sheperd, Mich.
525,308—Vehicle Thill or Pole Support. John Bairet, East Port Chester, Conn.

Patents Expired September 4, 1911.

- 525,334—Thill Coupling. Walter B. Clark, Chicago, Ill.
525,542—Thill Coupling. Charles L. Halstead, LaCrosse, Wis.
525,545—Buggy Top Rest. John Hellrath, Sacramento, Cal.
525,550—Wheel Hub. Sidney Johnson, London, Eng.
525,604—Thill Coupling. John A. Ketting, Martinsville, Ill.
525,618—Wagon Brake. Benjamin F. Pascoe, Globe, Ariz.
525,633—Wagon Eng Gate. George E. Stewart and Ralph Stewart, Philo, Ill.
525,639—Clamp for Wagon Bodies. Alonzo L. White and Squire J. Dean, Champaign, Ill.

Patents Expired September 11, 1911.

- 525,768—Vehicle for Spreading Sand. Andrew Laflamme, Nashua, N. H.
525,850—Wagon Brake. Mads H. Madsen, Kimballton, Iowa.
525,908—Convertible Carriage Body. Charles Klauber, New Haven.
525,981—Spoke and Tire Tightener. James M. Hawley, Odin, Ill.
525,944—Doubletree for Vehicles. Samuel J. McDonald, Gallatin, Mo.
525,995—Fifth Wheel. Samuel K. Faden, Petersburg, O.

Patents Expired September 18, 1911.

- 526,041—Buggy Cushion. Frank Long, Fort Wayne, Ind.
526,042—Mill Wagon. John H. Martin, Massillon, O.
526,108—Shaft Support for Vehicles. Charles H. Knight, Philadelphia, Pa.
526,132—Automatic Wagon Brake. David W. Lee, Harrisville, N. Y.
526,185—Pneumatic Tire. Joseph N. Goldbacher, New York, N. Y.

- 526,223—Corner Iron for Vehicle Seats. Charles C. Field, New York.
526,233—Buggy Boot. William J. Kauffman, Miamisburg, O.

Patents Expired September 25, 1911.

- 526,430—Lever Attachment for Raising and Lowering Buggy Tops. James B. Aton, Morganfield, Ky.
526,473—Thill Coupling. Mark Wemple, Chicago, Ill.
526,506—Spring Shackle for Vehicles. Henry C. Swan, Oshkosh, Wis.
526,611—Wagon Brake. James W. Brubaker, Tracy, Iowa.
526,620—Wagon Brake Lock. Robert Ford, Sr., Earlring, Ia.
526,222—Wheel. Howard P. Garland, Petaluma, Cal.
526,664—Safety Vehicle. William Chaninell, Philadelphia, Pa.

Patents Expired October 2, 1911.

- 526,691—Thill Support. John E. Dolber, Manchester, N. H.
526,798—Lamp Supporter for Vehicles. Jacob Wise, Mogadore, Ohio.
526,952—Two-Wheeled Vehicle. William F. Valentine, Circleville, O.
526,715—Suspension Rim for Vehicle Wheels. Edward B. Killen, Belfast, Ireland.
526,971—End-Board Chute for Wagons. John H. Irlon, Table Rock, Neb.
527,010—Thill Coupling. Richard Brent and Edwin Brent, Wilkes-Barre, Pa.

Patents Expired October 9, 1911.

- 527,068—Vehicle. Lawson W. Hampton, Elizabethton, Tenn.
527,101—Thill Support. Demas A. Barrackman, Decatur, Ill.
527,148—Thill Coupling. Walter S. Hartley, Little York, Ill.
527,162—Storm Hood for Top Carriages. Arthur W. Scidmore, Three Rivers, Mich.
527,183—Top Prop for Buggies. Lewis C. Pollard, Waterville, Me.
527,296—Vehicle Brake Shoe. Henry F. Shepard, New York, N. Y.

Patents Expired October 16, 1911.

- 527,470—Vehicle. Charles W. Wilbor, Rochester, N. Y.
527,475—Combined Shaft Supporter and Anti-Rattler. Elmer E. Blackman, Raymond, Neb.
527,596—Coach Step. Bernard D. Druen, New Haven, Conn.
527,659—Ball Bearing for Vehicles. Edward L. Brown, Spottswood, Va.
527,666—Vehicle. John W. Cleary, Brooklyn, N. Y.
527,710—Combined Thill Support and Anti-Rattler. Peter H. McLean, Jamestown, N. D.
527,727—Wheel for Vehicles. Edward G. Schleicher, Stamford, Conn.
527,735—Wheel. Nils O. Starks, Madison, Wis.

Patents Expired October 23, 1911.

- 527,781—Flexible Tire and Rim for Wheels. Sterling Elliott, Newton, Mass.
527,782—Flexible Tired Wheel. Sterling Elliott, Newton, Mass.
527,806—Delivery Wagon. John W. Pile, Marietta, Ind.
527,909—Carriage. Francis N. Vanier, Amesbury, Mass.
528,032—Buggy Top Support. Alva N. Rooks, Iuka, Ill.
528,102—Thill Support. Jere Hurley, Ellsworth, Me.
528,125—Wheel. Henri B. Gleason, Oneida, N. Y.

Patents Expired October 30, 1911.

- 528,338—Anti-Rattler for Thill Couplings. Martin McKinnon, Maxton, N. C.
528,351—Thill Coupling. Cornelius Wilcox, Sunbury, Ohio.
528,376—Vehicle Wheel. Frank Mendenhall and Thomas F. Mendenhall Morepark, Mich.
528,411—Wheel Rim for Pneumatic Tires. Thomas Birch, Leeds, Eng.
528,451—Pneumatic Tire and Wheel Rim. Pardon W. Tillinghast, Providence, R. I.
528,458—Carriage Spring. Charles A. Behlen, Cincinnati, O.
528,482—Axle for Vehicles. James Miller, Orlando, Fla.

Patents Expired November 6, 1911.

- 525,538—Sand Band for Wagons. James A. Fulton, South Bend, Ind.
528,580—Eyelet for Carriage and Buggy Curtains. DeWitt C. Woolsey, Middlebush, N. J.
528,581—Lock for Doors of Moving Vehicles. Charles A. Wright, Philadelphia, Pa.
528,595—Wagon. Marcus P. Jacobson, Jamestown, N. Y.
528,605—Automatic Vehicle Brake. James A. Mounce and Daniel Delaney, Fredericktown, Mo.
528,666—Vehicle Wheel Rim. Robert A. Gibson, Buffalo, N. Y.
528,670—Thill Coupling. James Henretty, Staples, Minn.
528,741—Joint for Vehicle Wheel Rims. Louis Rastetter, Fort Wayne, Ind.
528,826—Wagon Brake. Vardiman T. Sweeney, Springfield, Ky.
528,887—Vehicle Wheel. Frederick Meyers, New York, N. Y.

WHERE OLD WAGONS FLOURISH.

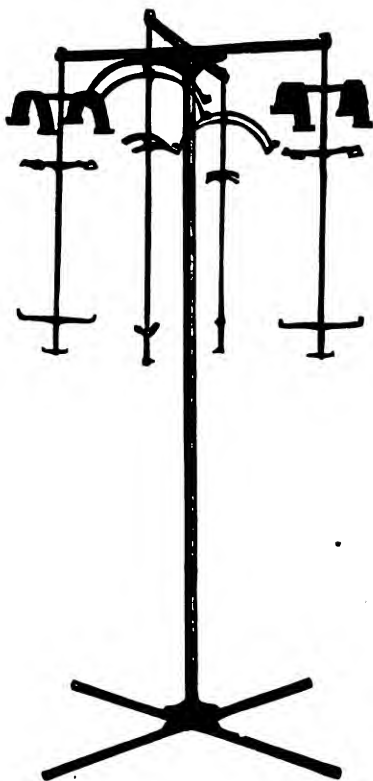
The long life of the old-fashioned but well made wagon is plainly seen by the following bit of history. In 1862 and 1863 A. G. Burton, a former blacksmith of Clinton, Mich., was a wagon maker and sold four wagons at the above named date to James Stewart, Junius Short, Columbus Aulls and Thomas Van Gieson. The first three wagons have been cut down and wide tires substituted some years ago but are still in active use. The Van Gieson wagon was sold in 1898 at an auction for \$22.50 and was sold again at an auction for \$16.20. F. M. Palmer has a wagon made by Starr, also of the same town, in 1852. This wagon has a crotch skein being made before the thimble skein came into use.

CEMENT FOR FASTENING COPPER TO SAND- STONE

Take 7 parts of white lead, 6 parts of litharrge, 6 parts of bole, and 4 parts of broken glass, and rub up with 4 parts of linseed oil varnish.

INDEX TO ADVERTISERS

American Roller Bearing Fifth Wheel Co. 22	Herbrand Co. 18	Pettingell Machine Co. 5
Bailey, S. R. & Co. 22	Higgin Mfg. Co. 4th cover	Pierce, F. O. Co. 3rd cover
Bicknell Mfg. & Supply Co. 12	Hoopes Bros. & Darlington 2nd cover	Porter, H. K. 20
Bokop, Webb & Palm 20	Hotel Cumberland 4	
Bowling Green Motor Car Co. 12	Jones & Co., Phineas 10-21	Racine Auto-Tire Co. 18-19
Buckeye Handle, Gear & Bending Co. 22	Indianapolis Paste Co. 22	Russell, Burdsall & Ward Bolt & Nut Co. 15
Buckeye Paste Co. 22	Keystone Forging Co. 20	Schubert Bros. Gear Co. 18
Burling, W. G. 22	Keystone Paint & Filler Co. 21	Shortsville Wheel Co. 14
	Keystone Sheet Metal Co. 13	Sherwin-Williams Co. —
Consolidated Ruber Tire Co. 1st cover	Landers Bros. Co. 19	Standard Steel Tube Co. 12
Columbus Bolt Works 4th cover	Lewis Spring & Axle Co. 21	Standard Wheel Co., Terre Haute, Ind —
Crane & MacMahon 2nd cover		Standard Wheel Co., Toledo, O. 12
"Crescent" Body Works 22		Standard Oil Cloth Co. 4
Crowe Nameplate & Eng. Co. 22		Smith, L. M. & Son 22
	Masury, John W. & Son 2nd cover	Stinson & Son, Edw. 22
Decker, J. C. 19	Mayo Radiator Co. 3	Straus & Son, M. 14
Delphos Hoop Co. 22	Meyer & Co., John C. 22	Schofield & Co. 22
Devoe, C. T. & Reynolds Co. 3rd cover	Millikan, G. W. 22	
Diefenthaler, J. V. 4	McKinnon Dash Co. 4th cover	Timken Roller Bearing Co. 1
Dowler, Charles L. 22	Metropolitan Lamp Co. 22	Union City Wheel Co. 13
Dreyer & Son, H. G. 11	Mohawk Valley Mfg. Co. 18	United Rim Co. 2
	Moller & Schumann Co. 3rd cover	
Eccles, Richard Co. 20	Moore & Co., Benj. 14	Valentine & Co. 3
Eureka Mower Co. 20	National Spring & Wire Co. 14	West Tire Setter Co. 14
	New Wapakoneta Wheel Co. 1	Woodman, Joel H. 22
Fabrikoid Co. 4	Ochsner & Sons Co., A. 22	Wiley & Co., C. A. 3
Fairfield Rubber Co. 19	Parry Mfg. Co. 6	Wilcox Mfg. Co. 17
Frost Gear & Machine Co. 21	Payne, E. Scott & Co. 20	Wiggers Co. 4th cover
Flint Axle Co. 20		
Gifford, John A. & Son 21		



No. 10.
Holds eight set of Driving
Harness. Entire rack re-
volves. Each hanger revolves
Price, \$10.00.

THE DEALER'S SALESMAN

Line of Display Racks

Adopted by the up-to-date dealers all over the
country.

BECAUSE THEY SAVE ROOM THEY SELL GOODS

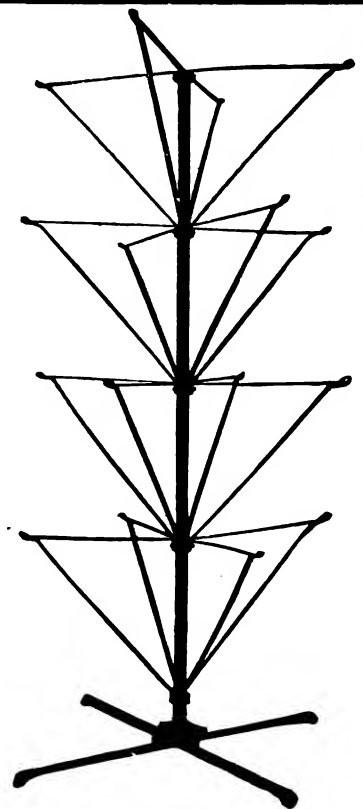
They give an up-to-date appearance to your
show room, and a buyer judges your goods by
the looks of your store.

THEY KEEP YOUR SAMPLES LOOKING NEW AND BRIGHT

They save time in showing your line, and lead
the customer to reach an immediate decision
instead of making the rounds, and perhaps
buying of a competitor.

Sold by All Leading Jobbers

Manufactured by
H. G. DREYER & SON
2256 W. 95th St., Cleveland, Ohio
WRITE FOR CATALOGUE.



No. 50.
Holds Collars, Blankets,
Robes, etc. Rack revolves.
Price, \$10.00.

Please mention "The Hub" when you write.

THE MODERN CAR FOR MODERN WAYS

QUIET RUNNING BUT POWERFUL

BEST SHOWING in Chicago-Detroit Reliability Contest. The ONLY CAR in its class making ENTIRE RUN ON ITS OWN POWER.



Model A—Engine, 30 H.P., 4-cycle; transmission selective; wheels 36x2, 36x3½ in. solid, capacity 1500-2000 lbs.

Model B—Engine, 22 H.P., 4-cycle; transmission selective; wheels, 32x3½, 33x4 in. pneumatic; capacity 500-1000 lbs.

The **BOWLING GREEN MOTOR CAR CO.**
BOWLING GREEN, O.

BICKNELL'S No. 90-B Punch and Shear

Designed
for close
work such
as punch-
ing tires
and simi-
lar work.



Made with
automatic
stripper if
desired.
Also made
in larger
sizes.

Write for catalogue of
HANDY MACHINERY FOR CARRIAGE AND WAGON SHOPS
MODERN GASOLINE MOTORS, ELECTRIC LIGHTING PLANTS

Bicknell Mfg. & Supply Co.
JANESVILLE, WISCONSIN

HOTEL LATHAM

5TH AV. AND 28TH ST.

NEW YORK

For Permanent and Transient Guests

EUROPEAN PLAN

Sample rooms for commercial men
Table d'Hote Luncheon, 50c

CLUB BREAKFAST, ALSO A LA CARTE

ROOMS WITH USE OF BATH, \$1.50 PER DAY
ROOMS WITH BATH, \$2. \$2.50 \$3. \$4. PER DAY

A. L. PRATT
MANAGING DIRECTOR

THE STANDARD STEEL TUBE COMPANY

Manufacturers of

STEEL TUBING

SPECIAL BENT TUBES for
AUTOMOBILES, MOTOR-
CYCLES, BICYCLES and
MACHINERY of all kinds
a specialty.

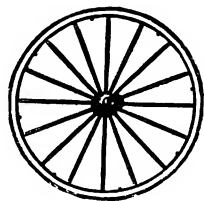
Toledo, Ohio,

U. S. A.

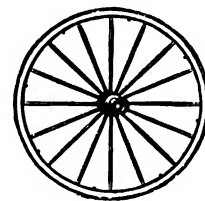
W H E E L S

FOR THE

CARRIAGE TRADE



Thoroughly seasoned, carefully selected materials of best Indiana quality. Sarven, Warner and Shell Band Wheels. We operate our own supply plant in Southern Indiana.



Prompt Shipments guaranteed.

SEND FOR CATALOGUE AND PRICES

UNION CITY WHEEL COMPANY

UNION CITY, IND.

All Steel Piano Box Buggy Bodies One Piece Steel Seats

No More
Checks,
Splits,
Corner
Breaks



Patent
Applied For

Write for our illustrated catalog showing a number of our other seats.

Furnished to most any width desired.

Keystone Sheet Metal Co.

Factory, Economy, Pa.

Office, Ambridge, Pa.

ALL STEEL BUGGY WHEEL

Write for
Descriptive
Booklet

The problem of an all-steel buggy wheel has been solved at last.



Patented
April 20, 1909.

The Standard Buggy Wheel is the acme of perfection in wheels; it has stood the most severe tests; is not affected by heat, cold or moisture.



Absolutely no tire troubles. Strong and light, being built of the finest bicycle steel.

Practical and durable, will not decay or rust, and is easily repaired.

It is cheap—cheaper than most if length of life is considered.

THE
STANDARD WHEEL CO.
TOLEDO, O.

Please mention "The Hub" when you write.

Attention!

FALL IN LINE

With the many who are actively interested in our

CUT LEATHER PROPOSITION

We are positive a trial order will convince you that to advertise High Quality Leather, with us means to fill your order with the best that money can buy. We know that you will be satisfied in every respect. - - - - -

Our figures will be mailed you promptly on receipt of your inquiry.

M. STRAUS & SONS

OFFICE:- 440 Frelinghuysen Ave.,

NEWARK, N. J.

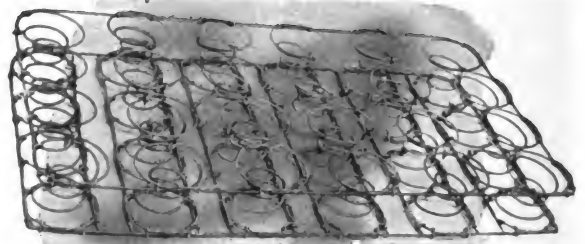
"BLACK VELVET" CUSHION SPRINGS

Manufactured Only by the

NATIONAL SPRING AND WIRE COMPANY

ALBION, MICH. WINDSOR, ONT.

THE SPRING OF QUALITY.



SPRING or SOFT EDGE CUSHION FRAME

For Buggies or Other Vehicles. Built of the Highest Grade of Steel Wire.



STRIP FOR WOOD OR BOX FRAME

THE SURPRISE IS YOURS

When You Open Your First Can of

MOORE VARNISH

Easy Working Perfect Flowing Long Lived
Highest Quality Under Every Label

BENJAMIN MOORE & COMPANY

Varnish Makers

New York

Chicago

Cleveland

Toronto

The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE

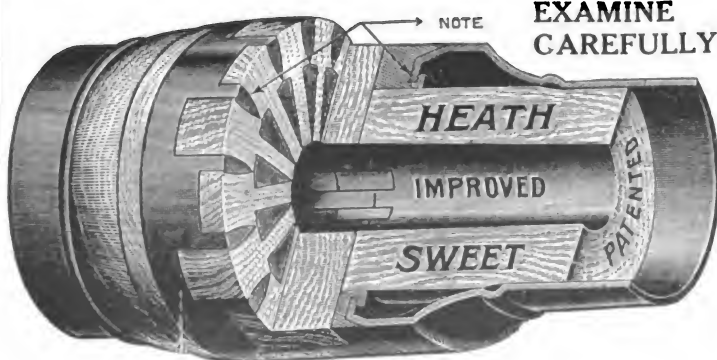


Tires set cold in one minute. This machine saves time — does the work better and quicker, does a way with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim, and thus make the tire loosen prematurely.

Saves resandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO.,

ROCHESTER, NEW YORK



NOTE
EXAMINE CAREFULLY

HEATH HUB

You Won't Find a Flaw

Manufacture also

SWEET SARVEN

KEENEY SHELL

WARNER WOOD

and

Automobile Wheels

SHORTSVILLE WHEEL CO.,

Shortsville, New York

Please mention "The Hub" when you write.

ADVERTISEMENTS CLASSIFIED

AUTOMOBILES

Bailey, S. R. & Co., (elec.) Amesbury, Mass.

AXLES

Flint Axle Works, Flint, Mich.
 Frost Gear & Machine Co., Jackson, Mich.
 Lewis Spring & Axle Co., Jackson, Mich.
 Timken Roller Bearing Co., Canton, O.

BODIES, SEATS, ETC. (Wood and Metal)

Burling, W. G., Philadelphia, Pa.
 Crescent Body Works, Reading, Pa.
 Keystone Sheet Metal Co., Ambridge, Pa.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Wiggers Co., Cincinnati, O.
 Woodman, Joel H., Hoboken, N. J.

BOLTS AND NUTS

Columbus Bolt Works, Columbus, O.
 Russell, Burdsall & Ward Bolt & Nut Co.,
 Port Chester, N. Y.

BOWS (Automobile and Carriage)

Millikan, G. W., Muncie, Ind.
 Delphos Hoop Co., Delphos, O.

BUCKRAMS.

Landers Bros. & Co., Toledo, O.

BUGGIES

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

CARRIAGE FORGINGS.

Columbus Bolt Works, Columbus, O.
 Eccles Co., Richard, Auburn, N. Y.
 Herbrand Co., Fremont, O.
 Keystone Forging Co., Northumberland, Pa.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.

CARRIAGES AND WAGONS (Finished)

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

**CARRIAGE, WAGON AND AUTOMOBILE
HARDWARE, SUPPLIES, ETC.**

Chas. L. Dowler, Philadelphia, Pa.
 Gifford & Son, John A., New York City.
 Higgin Mfg. Co., Newport, Ky.
 Payne Co., E. Scott, Baltimore, Md.
 Landers Bros. Co., Toledo, O.
 Mohawk Valley Mfg. Co., Utica, N. Y.

COMMERCIAL MOTOR WAGONS, TRUCKS

Bowling Green (O.) Motor Car Co.

CUSHION MFGRS.

Chas. L. Dowler, Philadelphia, Pa.

COLORS

Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 Valentine Varnish Co., New York, Chicago,
 Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

DASHES, FENDERS, ETC.

McKinnon Dash Co., Buffalo, N. Y.
 Burling, W. G., (Metal) Philadelphia, Pa.

DISPLAY RACKS.

H. G. Dreyer & Son, Cleveland, O.

FIFTH WHEELS.

Eccles Co., Richard, Auburn, N. Y.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.
 American Roller Bearing Fifth Wheel Co.,
 Brooklyn, N. Y.
 Keystone Forging Co., Northumberland, Pa.

GEAR WOODS.

Buckeye Handle, Gear & Bending Co., Alliance, O.

JACKS

Eureka Mower Co., Utica, N. Y.

LEATHER, PATENT AND ENAMELED

Diefenthaler, J. V., Newark, N. J.
 M. Straus & Sons, Newark, N. J.
 L. M. Smith & Son, Newark, N. J.

LEATHER SPECIALTIES

Decker, J. C., Montgomery, Pa.

LINSEED OIL

Sherwin-Williams Co., Cleveland, O.

MACHINERY AND TOOLS.

Bokop, Webb & Palm, Defiance, O.
 Porter, H. K., Everett, Mass.
 West Tire Setter Co., Rochester, N. Y.
 Frost Gear & Machine Co., Jackson, Mich.
 Pettingell Machine Co., Amesbury, Mass.

MACHINERY. (Woodworking)

Bicknell Mfg. & Supply Co., Janesville, Wis.
 Pettingell Machine Co., Amesbury, Mass.

MOUNTINGS (Including Lamps)

Crowe Name Plate & Engraving Co., Chicago
 Ochsner & Sons Co., A., New Haven, Conn.
 Metropolitan Lamp Co., Newark, N. J.

MUFFLERS (Auto)

Mohawk Valley Mfg. Co., Utica, N. Y.

NAME PLATES

Crowe Nameplate & Eng. Co., Chicago, Ill.

PASTE

Buckeye Paste Co., Columbus, O.
 Indianapolis (Ind.) Paste Co.

RADIATORS.

Mayo Radiator Co., New Haven, Conn.

RIMS.

United Rim Co., Akron, O.

ROLLER CHAFE IRONS

Mohawk Valley Mfg. Co., Utica, N. Y.

RUBBER TIRES

Autos, Pneumatics, Etc.

Consolidated Rubber Tire Co., New York Cy.
 Racine Auto Tire Co., Racine, Wis.

Carriages, Solid, Etc.

Consolidated Rubber Tire Co., New York Cy.

SEATS

Schubert Bros. Gear Co., Oneida, N. Y.
 Keystone Sheet Metal Co., Columbus, O.
 Wiggers Co., Cincinnati, O.

SLEIGH RUNNERS.

Schofield & Co., Freeport, Ill.

SHAFT COUPLINGS.

Eccles Co., Richard, Auburn, N. Y.
 Higgin Mfg. Co., Newport, Ky.

SHAFT STRAPS.

Decker, J. C., Montgomery, Pa.

SPRINGS (Cushion)

National Spring & Wire Co., Jackson, Mich.

SPRINGS, GEARS, ETC.

Frost Gear & Machine Co., Jackson, Mich.
 Lewis Spring & Axle Co., Jackson, Mich.
 Schubert Bros. Gear Co., Oneida, N. Y.

THREADS

Meyer & Co., John C., Lowell, Mass.

TRIMMING MATERIAL

Rubber Drills, Enameled Goods, Imitation
 Leather, Etc.

Fabrikold Works, Newburg, N. Y.
 Fairfield Rubber Co., Fairfield, Conn.
 Standard Oil Cloth Co., New York City.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Landers Bros. Co., Toledo, O.

TOPS

Schubert Bros. Gear Co., Oneida, N. Y.

VARNISHES, PAINTS AND JAPANS

Devos, F. W., and C. T. Reynolds, N. Y. C.
 Keystone Paint & Filler Co., Muncie, Pa.
 Moore & Co., Benj., Cleveland, O.
 Moller & Schumann Co., Brooklyn, N. Y.
 Masury & Son, J. W., New York and Chicago
 Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 Valentine Varnish Co., New York, Chicago,
 Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

VEHICLES.

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

WHEELS AND WHEEL STOCK.

Crane & MacMahon, New York City.
 Union City Wheel Co., Union City, Ind.
 Gifford & Son, John A., New York City.
 Hoopes Bros. & Darlington, West Chester, Pa.
 Jones & Co., Phineas, Newark, N. J.
 New Wapakoneta Wheel Co., Terra Haute,
 Ind.
 Stinson Edw. W. & Co., Baltimore, Md.
 Standard Wheel Co., Terra Haute, Ind.
 Standard Wheel Co., Toledo, O.
 Shortsville Wheel Co., Shortsville, N. Y.

STEEL WHEELS

Standard Wheel Co., Toledo, O.

WOOD STOCK, BENT WOOD, ETC.

Buckeye Handle, Gear & Bending Co., Alliance, O.
 Crane & MacMahon, New York City.
 Delphos Hoop Co., (Bows) Delphos, O.
 Gifford, John A. & Son, New York City.
 Millikan, G. W., Muncie, Ind.
 Woodman, Joel H., Hoboken, N. J.

WHITE LEAD.

Sherwin-Williams Co., Cleveland, O.

MISCELLANEOUS

Oliver Typewriter Co., New York—Chicago



BOLTS Rivets, Carriage Makers' Washers
 and Burrs for all kinds of Vehicles
Russell, Burdsall & Ward Bolt and Nut Co.
 Main Works, PORT CHESTER, N. Y. Branch at Rock Falls, Ill.

Please mention "The Hub" when you write.

Which is more perilous
—farming or metal
working?

In occupational injury
where does the
average of fault lie?

What nation sets the
standard in
accident prevention?

On what day
of the week
do the
most accidents
occur?

How much
of the compen-
satory
award
reaches the in-
jured workman?

What relief
system does
most
for indus-
trial efficiency?

Who are more
subject to
accident—
male or fe-
male workers?

Why are New
York accident
rates many
liability
times those
of Germany?

How can
American
liability
methods be
improved?

What are the
defects
of the English
system?

How can our
annual roll of
over
1,000,000
casualties be
reduced?

What propor-
tion of the
insurance
should the
employer bear?

What did
10,000 manu-
facturers
say of our
present liability
system?

AN EPOCH MARKING WORK!

ACCIDENT PREVENTION AND RELIEF

An investigation of the subject in Europe, with special attention to England and Germany, together with recommendations for action in the United States.

By **Ferd. C. Schwedtman and James A. Emery**

For the National Association of Manufacturers

BASIC facts underlying the whole subject of industrial accidents; the principles of accident prevention; equitable systems of compensatory awards, are embodied in this exhaustive analysis of industrial employments with regard to the safety of the individual, the conservation of human life and the welfare of the State.

A BOOK OF THE UTMOST VALUE

For the Employer, the Workman and the Legislator

CONTENTS

- Chapter I. Outline and Underlying Principles of European Compensation Legislation.
- Chapter II. Underlying Principles and General Working of the German Scheme of Compensation for Occupational Accidents.
- Chapter III. Detailed Description of Some of the Important Features of the German System—Efficiency, Prompt and Proper Medical Aid, the "Doctor Question," the Contributory Principle.
- Chapter IV. Obligatory Insurance An Important Factor in Accident Compensation—Various Forms of Insurance, Mutual Insurance, Statistics, Scientific Inspection, Litigation.
- Chapter V. Hazardous Occupations—Comparative Hazard of Industry and Farm.
- Chapter VI. Prevention of Accidents, Cause and Cure of Injuries, European Safety Museum (Accident Prevention Institutions).
- Chapter VII. Cost of Accident Compensation Insurance in Germany in Comparison with similar rates in the United States.
- Chapter VIII. Employers' Liability in Great Britain Prior to the Compensation Acts.
- Chapter IX. The Introduction of the Compensation Principle by the Acts of 1897 and 1900, and the Investigation of the Operation of this Legislation by the Departmental Committee of 1904.
- Chapter X. The Final Extension of the Compensation Principle. The Act of 1906. Outline of Its Provisions and Examination of the Nature and Extent of Its Liabilities.
- Chapter XI. British Compensation Statistics. The Neglect to Record the Operation of the Earlier Acts Incompletely Remedied by Partial Information Required Concerning the Act of 1906.
- Chapter XII. Insurance under the Compensation Acts.
- Chapter XIII. Primal Defects of the British Legislation.
- Chapter XIV. Finding and Recommendations of the Committee.

APPENDIX.

Copiously illustrated with half tones, charts, and diagrams in color

Prices: Half Morocco [de luxe edition], \$15; Cloth \$10

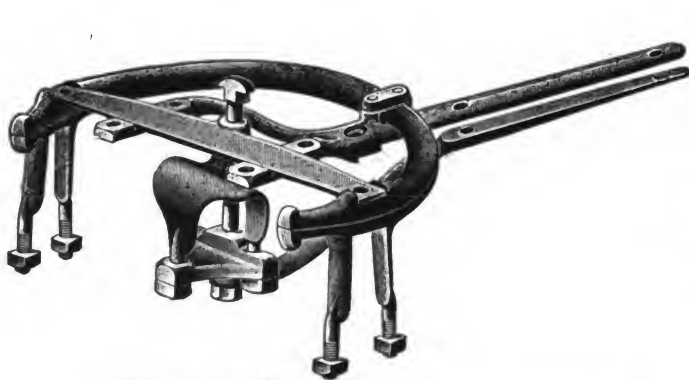
ADDRESS

THE NATIONAL ASSOCIATION OF MANUFACTURERS
Terminal Building 30 CHURCH STREET, NEW YORK CITY

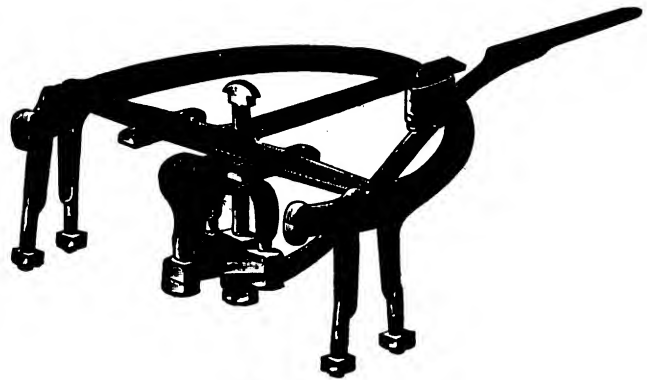
What is total disability
as applied to the injured
worker?

How can the "ambu-
lance chasing" practi-
tioner be eliminated?

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



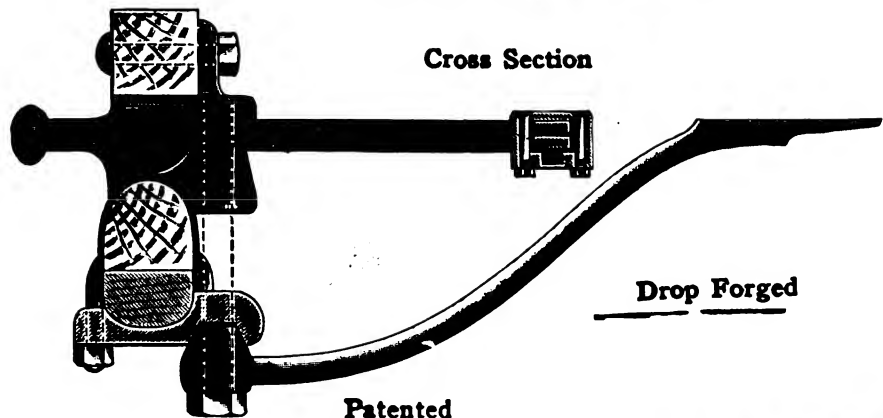
No. 1908—Gear Iron



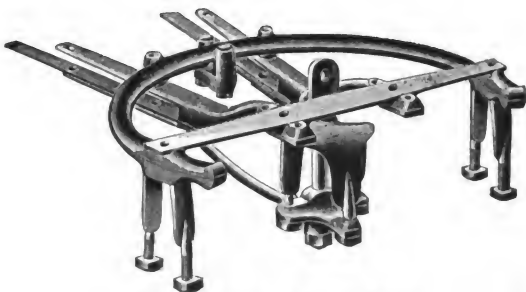
No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

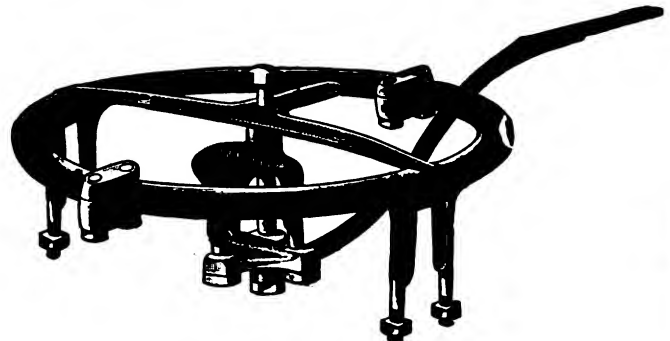
Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.



S
U
R
E
S
A
F
E



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and that's good news involved in the handling of

THE RACINE AUTO TIRE

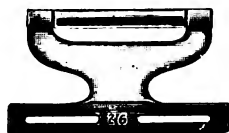
We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

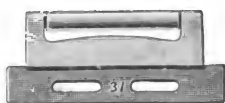
BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

ROLLER CHAFE IRONS, VISES AND HARDWARE SPECIALTIES

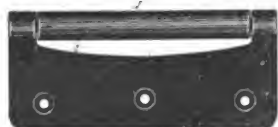
Largest Manufacturers of Roller Chafe Irons in the World. We have just what you want for any vehicle, and remember,
WE SHIP PROMPTLY.



No. 32—For end spring jobs with full length body loops.



No. 69—For Phaetons and Stanhopes.



We also manufacture the cheapest and most durable Automobile Muffler in the world. Can be easily attached to any automobile manufactured.

"We are Known as Prompt Shippers"

MOHAWK VALLEY MANUFACTURING CO.
UTICA, N. Y.

VEHICLES AND GEARS IN THE WHITE



PREMIER
SIDE SPRING GEAR

We also manufacture a full line of CARRIAGE and WAGON BODIES in the white; also LIMOUSINE, TAXICAB, TOURING CAR and ROAD-STER BODIES in metal. Fifty styles of gears for Carriages and Wagons; also seats, trimmings and tops of all kinds. Write to us for particulars.

SCHUBERT BROS. GEAR COMPANY
ONEIDA, NEW YORK

ESTABLISHED 1855

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

AUTOMOBILE WHEELS

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply the Standard Universal Quick Detachable and Quick Detachable Demountable Rims.

REPAIRING OF AUTOMOBILE TRUCK WHEELS.

Please mention "The Hub" when you write.

CUSTOMER·A·SATISFIED·CUSTOMER

BECAUSE, those cup-like studs that you see in our illustration will grip the ground just where, and just when, the ground needs gripping; so that he is free from the danger of skidding and slipping.

BECAUSE, his tire EXPENSE account will show a difference such as will cause him to talk enthusiastically to others about you and the RACINE AUTO TIRE.

All this counts for good business; so get busy. The RACINE AUTO TIRE is going into the hands of live, pushing dealers. We shall make it equally advantageous to them as to us. Be amongst the live ones. Take our proposition. Do it now; and together let us do it thoroughly.

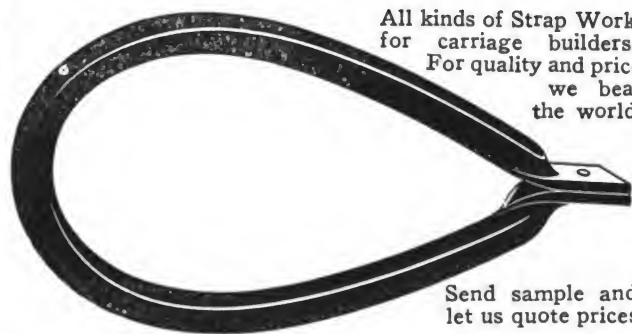
RACINE AUTO TIRE COMPANY

500 14th Street

RACINE, WISCONSIN



AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES



All kinds of Strap Work for carriage builders. For quality and price we beat the world.

Send sample and let us quote prices

J. C. DECKER

Montgomery Pa.

THE FAIRFIELD RUBBER COMPANY

Manufacturers of

Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.

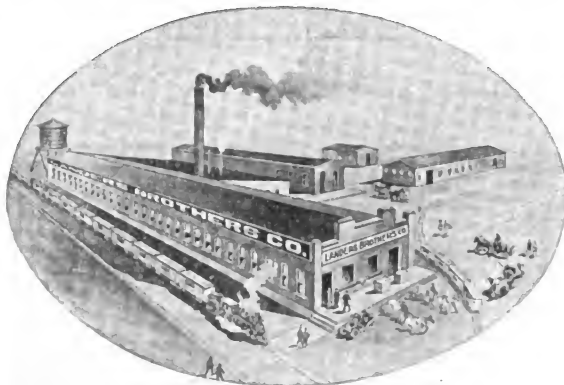
FAIRFIELD,

CONNECTICUT

Buckram, Webbing,

Made in Our Factory

Burlap, Strain Straps, Celluloid



Top Material,
Fibre Cord,
Wadding,
Enamelled Muslins,

Sheeting,
Bow Lining,
Cushion Canvas,
Drills and Ducks

Landers Brothers Co.,
TOLEDO, OHIO.

Prompt Shipments

Best Goods

Lowest Prices

WE MAKE
Rear Dead Axles

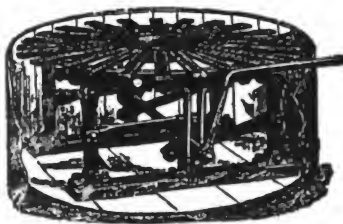
for
Motor Trucks
and
**Machine Motor
Truck Hubs and
Flanges - - -**

FLINT AXLE WORKS
FLINT, MICHIGAN

Manufacturers of
CARRIAGE AXLES

Write For Prices,

Mentioning HUB



The Bokop Tire Setter and Cooler
is the Best and Only Machine
that has stood the test during
the last 12 years on all classes of
work, and is the Only Machine
built with the Indestructible
Wrought Iron Face Plate.
Over 1,000 are in successful op-
eration, repairs on which have
not exceeded \$6.00 in the last 12
years. For prices, references and
descriptive circulars, address
BOKOP, WEBB & PALM,
Jefferson, Ohio

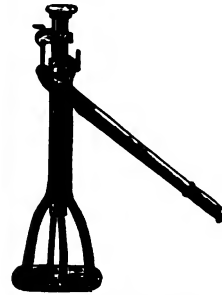
Richard Eccles Co., Auburn, N.Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile' Special

Send for Catalogue No. 17.

EUREKA WAGON JACKS



Will easily raise a loaded wagon.
Raises any height desired—not
limited to certain heights.

Constructed of steel and malle-
able iron.

Not a bolt, spring, rivet or ratch-
et used.

Has nothing to wear out or give
trouble.

Pays dealers good profits. Sev-
eral hundred thousands in use.

Eureka Mower Company

215-225 Schuyler St.,

Utica, N. Y

ESTABLISHED 1886.

**Correspondence School of Carriage and Motor
Carriage Drafting**

A thorough, practical tuition is given through this cor-
respondence school. The theory and practice of con-
struction, bookkeeping, perspective. Many men now hold
good positions through taking the courses of instruction.

Principal, THOS. MATTISON,
Hillside Avenue, Bitterne Park,
Southampton, England.

Author of "The Coach Body Makers' Guide," \$3.00; a
practical treatise on "The Suspension of Carriages,"
"Bookkeeping," and other carriage building works.

E. SCOTT PAYNE Co.
OF BALTIMORE CITY
**CARRIAGE AND AUTOMOBILE
HARDWARE**

362 and 364 North Gay Street,
BALTIMORE, MD.

PORTER'S BOLT CLIPPERS

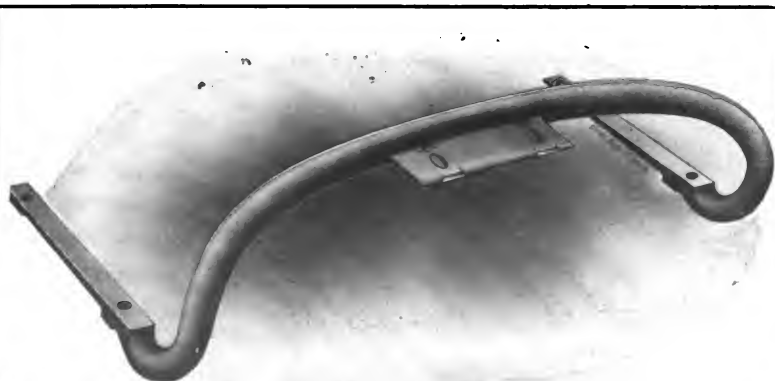
"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 Inch.

H. K. PORTER,

EVERETT, MASS.



Patented December 7, 1897.

Bailey Body Hanger

BUGGY and SURREY SIZE

QUICK SHIPMENTS

WRITE FOR PRICES

The Keystone Forging Co.

Northumberland, Pa.

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

SPRINGS

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

GEARS

We have Automobile
Gears for every purpose
in stock upon which
we can save you money.

FROST GEAR & MACHINE COMPANY
JACKSON, MICHIGAN



KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

It fills the pores of Metal and Wood perfectly. Sand-
papers easily and produces a fine smooth surface
that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

Jones Wheels

BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.

NEWARK, N. J.

Branch Factory:

12th Ave. and 55th St., New York City.

BUSY BUYERS BRIEFS

DELPHOS HOOP COMPANY

MANUFACTURERS OF
HIGH GRADE BUGGY and AUTOMOBILE BOWS
Delphos, Ohio
No Order Too Large Or Too Small Mention HUB

The "CRESCENT" Body Works

Reading, Pa.
Builders of High Grade **Auto Bodies** to order
Of Wood or Metal in the White or Finished.

L. M. SMITH & SON Leather

Carriage, Furniture and Automobile
NEWARK, N. J.
59-71 Lock St. 234-236 Central Ave.
Office 59 Lock St.

G. W. MILLIKAN

Manufacturer of
HIGH GRADE BOWS OF ALL KINDS
AUTO BOWS a Specialty.
Muncie, Ind.

H. Welchhold L.D.Phone, 2290-W Market

METROPOLITAN LAMP COMPANY

Manufacturing and Repairing of
AUTOMOBILE SEARCH and SIDE LAMPS
COACH and CARRIAGE LAMPS
Makers of All Kinds of Metal Goods. Nickel
and Silver Plating.
24 Mechanic St., **NEWARK, N. J.**



CHARLES L. DOWLER
CARRIAGE AND WAGON HARDWARE
108 North Third St., Philadelphia, Pa.
CUSHION MAUFACTURER
Pure Stearic Acid Candles. Wheel Stock. Snow
Flake Axle Grease.

Special Carriage Trimmers Paste GUARANTEED VERMIN PROOF

Get our prices on our No. 38 before
making your 1912 contracts.

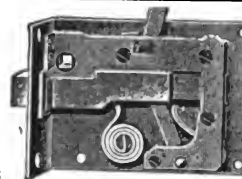
BUCKEYE PASTE CO.
COLUMBUS, OHIO The Hub

METAL PARTS FOR MOTOR BODIES
Hammered Work a Specialty
Fenders, Gasoline Tanks, Japanning Ovens
W. G. Burling 1924 Commerce Street,
PHILADELPHIA, PA.

John C. Meyer & Co. Threads
Manufacturers of
HIGH GRADE
and SPOOL SILKS for Carriage
and Automobile Trade
Address—LOWELL, MASS.

Carriage Trimmers' PASTE

Fourteen years the standard
OUR LATEST PRODUCT
"Trimmers' Stickstay"
A Sure-Sticking Dry product that WILL NOT FREEZE
Write for Samples.
INDIANAPOLIS PASTE CO., Indianapolis, Ind.



**A. Ochsner & Sons
COMPANY**
1061 State St. N. H. Conn.
Auto and Carriage
Locks, Hinges, Fix-
tures, Etc., and
Bodymakers Tools

Quality, Style, Durability and Quick
Delivery.

The Edward Stinson Mfg. Company VEHICLE WHEELS

327-335 North Street, **BALTIMORE, MD.**

SCHOFIELD & COMPANY

Manufacturers of
**Schofield's Steel
Runner Attachments**
Freeport, **Illinois**

S. R. BAILEY & CO. Inc.

Makers of the Celebrated
Whalebone Road Wagon
AMESBURY, MASS.

TRUCK BUILDERS

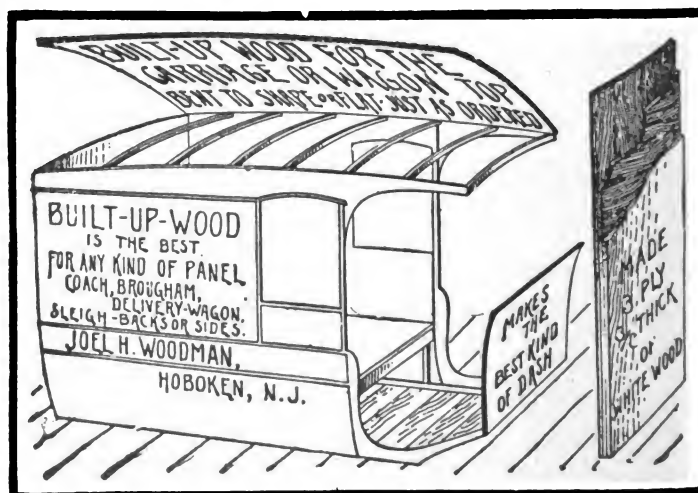
If you only realized the inestimable value
of roller bearing fifth wheels on trucks, vans, deliv-
ery wagons and all other medium and heavy
vehicles, no job would leave your shop without

Roller Bearing Fifth Wheels

WHY? The adjustment is perfect. No oil or
grease required. Almost indestructible. Will out-
wear any vehicle. Saves horseflesh and prolongs
life of vehicle. Ask your jobber for the celebrated

NIELSON OR KING

Let us send you Catalogue and Price List.
American Roller Bearing Fifth Wheel Co.
745 THIRD AVE., BROOKLYN, N. Y.



The Buckeye Handle Gear & Bending Co. ALLIANCE, OHIO

Manufacturers of Gear Woods
OUR OLD RELIABLE GEAR SET
The Most Complete Set on the Market. Write for Catalogue and Prices

Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.

F. O. PIERCE COMPANY

NEW YORK, U. S. A.

Manufacturer of High Class Pigment Colors
from ORIGINAL FORMULAE. Colors ground in
Japan and other MEDIUMS to meet any
SYSTEM of APPLICATION

Our Latest Production UZATONA EXTRA LIGHT for Automobile Painting

Our Automobile Color Book just issued showing latest shades for this class of work
mailed upon application.

MOLLER & SCHUMANN COMPANY

COLORED RUBBING

Most perfect as to working, drying and wearing.

CARRIAGE & AUTO VARNISHES

Send for color card and descriptive price list.

**Office and Factory - BROOKLYN, N. Y. Chicago Branch - 110 N. Desplaines St.,
San Francisco Branch - 1022-1024 Mission St.**

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



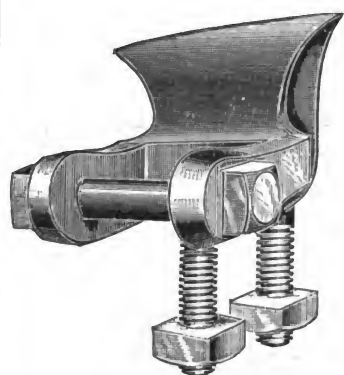
No. 263-N with Nickel Rail.

ARE YOU IN LINE

With the Leaders for 1912?

THEY WILL USE DASH RAILS

Welded Solid To The Dash Frame



Skewed Shaft Couplings

**Regular or Oval Patterns
For High Arched Axles**

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



WIGGERS' BODIES

Automobile - Carriage
MERIT CONSIDERATION



Just One of Many Styles.

Because { THEY HAVE { Style
 { AND ARE { Quality
 { Symmetrical Outlines
 { Well Seasoned
 { Made to Wear
 { Priced Right

Address
THE WIGGERS COMPANY

Manufacturers of Carriage
and Auto Bodies and Seats

1417 to 1423 Plum St.

Cincinnati, Ohio

The Higgin

LINE OF CARRIAGE TRIMMINGS

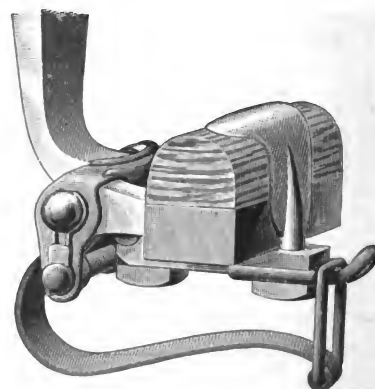
KNOB



No. 70.



No. 133



(Closed.)
The Higgin Quick Shifter.

KNOB



No. 72.



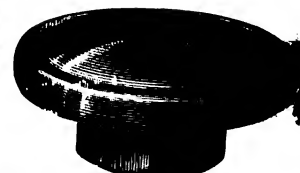
No. 130.



Full Leather Nut



No. 74.



Black Japan Nut

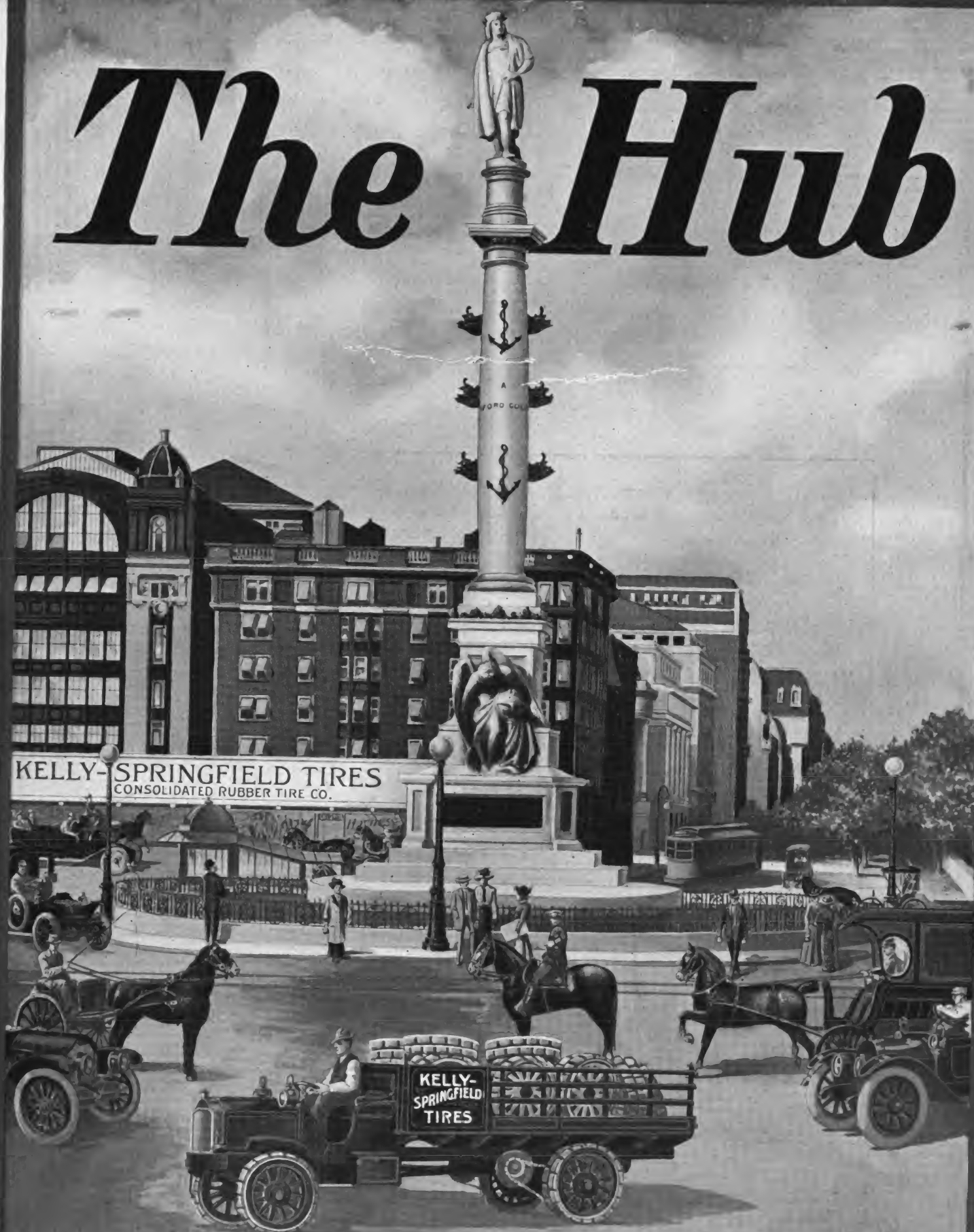
QUALITY UNSURPASSED.

Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co.

Newport, Ky.

The Hub



TRADE NEWS PUBLISHING COMPANY
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN
STAR or KENNY
Sweet Concealed Band
WOOD HUB
WARNER

WHEELS

HEAVY and LIGHT
for
CARRIAGES
WAGONS and
TRUCKS

IF YOU WANT THE BEST TRY OURS

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York,

Chicago,

Minneapolis,

Kansas City



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT,  ACORN,  and STAR  BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO.

RICHMOND, VA.

For Export Prices apply to the New York Office.

**WAGONS WITH
TIMKEN ROLLER BEARING AXLES
DON'T HAVE AXLE TROUBLES**

Axle troubles are due to friction and wear. Timken Roller Bearing Axles cut friction to almost nothing and Timken Roller Bearings are adjustable for any and all wear.

The Timken Roller Bearing Axle is the most practical and the most profitable anti-friction axle to sell. It reduces draft 50 per cent, cuts feed, shoeing, harness and repair bills in two, and makes pleased wagon buyers whose trade you hold.

The extra profit on a wagon with Timken Roller Bearing Axles is well worth having — and every such wagon sells another.

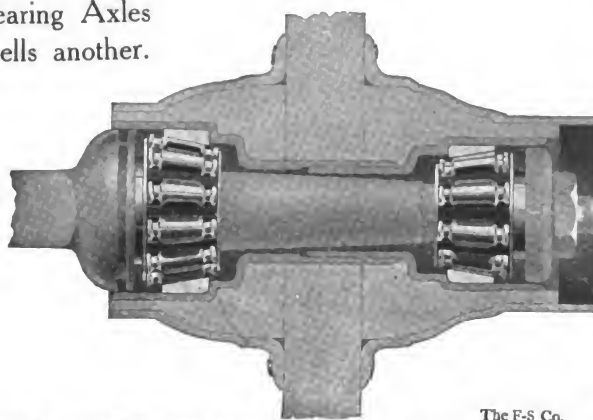
GUARANTEED FOR TWO YEARS
SEND FOR CATALOG AND PRICE LIST

**The Timken Roller Bearing Co.,
CANTON, OHIO**

NOTE—We make Timken Roller Bearings for all automobile applications.

Note—Pleasure and Commercial Car Axles and Jack Shafts with TIMKEN ROLLER BEARINGS furnished by the Timken-Detroit Axle Co., Detroit, Mich.

New York Office: 68th and Broadway.
Chicago, 1347 S. Michigan Ave.



The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

**THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO**

Please mention "The Hub" when you write.



No. 1.

THE VALUE OF



No. 2.

STANDARD UNIVERSAL RIMS

TO THE AUTO OWNER

When your car is equipped with STANDARD UNIVERSAL RIMS you are always prepared for the unexpected puncture or blow-out. No time or temper lost in changing tires.

TO THE MANUFACTURER

By equipping your car with STANDARD UNIVERSAL RIMS you are increasing the value of your car without increasing the cost of manufacturing. Automobile buyers demand STANDARD UNIVERSAL RIMS.

TO THE TIRE MAKER

The auto driver remembers the rim he has had the least trouble with. STANDARD UNIVERSAL RIMS aid in a pleasant remembrance of tires. Both straight side and clincher casings can be used on the same rim. The changing of tires is simple, two turns unlocks and two turns locks our Nos. 1 and 2 rims. To demount our No. 3 rim simply unscrew the wedges.



No. 3.

Send for our illustrated catalogue

UNITED RIM CO.

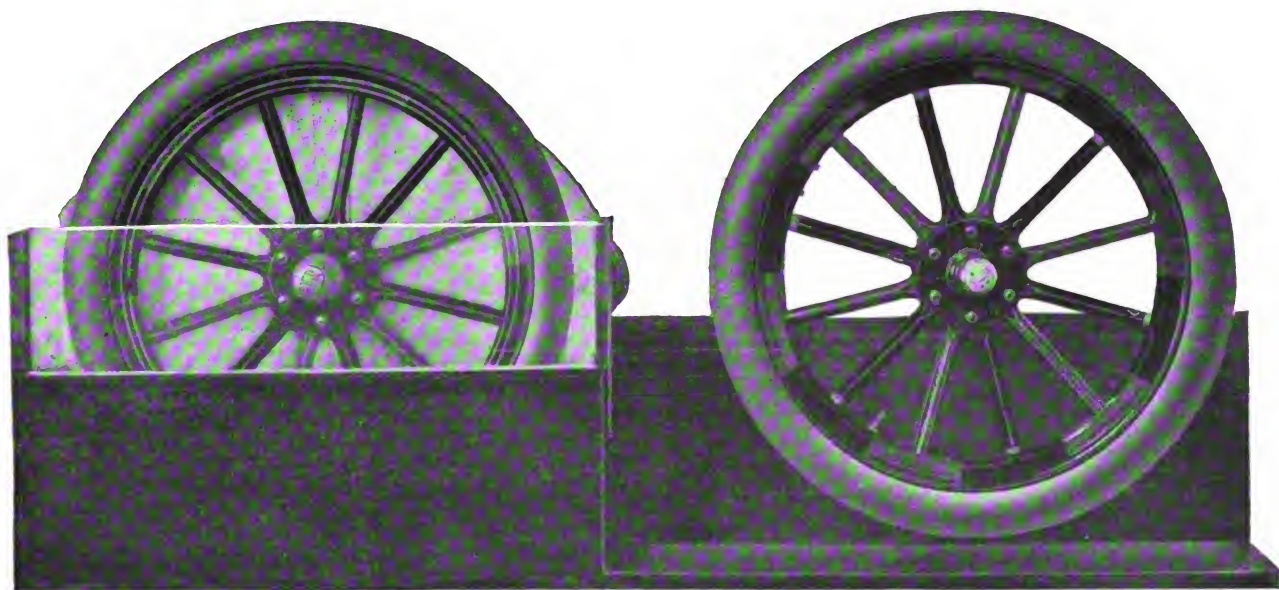
AKRON, O.



No. 4.

We will exhibit in New York at Madison Square Garden Show, Concert Hall Space, No. 315.

Please mention "The Hub" when you write.



The Finish That Defies Soap

A startling demonstration of a Varnish absolutely unharmed by the caustic action of automobile soap is a feature of our exhibit at the automobile shows this winter.

Very likely you have seen the wheel revolving in the soapy water at our booth and have noted that the finish on half the spokes remained in perfect condition, while that on the remaining spokes lost its lustre before your eyes.

Six of the spokes of the wheel are finished with the best automobile gear varnishes heretofore made. They cannot withstand soap. The other six spokes are finished with

VALENTINE'S VANADIUM CHASSIS FINISHING

These spokes stand up absolutely unharmed after weeks of exposure to soap and water.

Every automobile manufacturer, every dealer, every owner knows, after sad experience, that there has been no finish un-

til now that has not been literally eaten up by soap. The condition of the hood, fenders and all the underparts of every automobile, after a few months of use is testimony for all the world to see.

Valentine & Company's new varnish on a chassis will remain in perfect condition for months. Prove this varnish for yourself.

We have prepared small pieces of tin, varnished on one side with one of the best known automobile gear varnishes and on the other side with Vanadium Chassis Finishing Varnish. If this tin is left in a solution of soap for thirty minutes the old fashioned gear varnish will lose its lustre. Our Vanadium Chassis Finishing will remain unharmed.

This bath in a strong soap solution is equivalent to a month or more in the garage.

Write for this tin. Just fill out the coupon and we will send it to you at once with attractive descriptive booklets.

VALENTINE & COMPANY
257 Broadway,
New York

343 So. Dearborn St.
Chicago.

74 Pearl Street
Boston.

TRADE **VALENTINE'S** MARK.

V.C.F.
Name
Address
City
State
Cut off and mail to
Valentine & Co.

TRADE MARK FABRIKOID

MACKINTOSHED FABRICS FOR AUTO and CARRIAGE TOPS

We offer a complete line of fabrics for auto carriage tops, curtains and upholstery.

MOHAIR MACKINTOSHED CLOTH.—

Our waterproofing process is superior to that used by other manufacturers of similar fabrics. This is guaranteed against leakage for one year. Pleasing patterns, standard widths and highest quality are other advantages which adapt it to the requirements of makers of tops for high grade autos and carriages.

FABRIKOID LEATHER FOR UPHOLSTERY—This is an improvement on leather and rubber for upholstering and trimming autos and carriages. It is durable, easily applied, quickly cleansed, will not fade, crack or peel—guaranteed.

Samples and Prices sent on request.
Address Dept. No. 269.

FABRIKOID WORKS, WILMINGTON, DEL.
(E. I. du Pont de Nemours Powder Co., Owner.)



**MERITAS
LEATHER
CLOTH**

The main cause for the exceptional demand on MERITAS Leather Cloth is its durability.

It's a low-priced leather substitute you can depend on to give proper service without cracking.

In weights, finishes and colors for all carriage and auto purposes.

Sample book on request.

Ask your jobber for MERITAS Leather Cloth if quality counts.

Standard Oil Cloth Co.

320 BROADWAY

NEW YORK

LEATHER

— THAT DON'T CRACK —

That can't be distinguished from machine buffed hide.

That wears as well as expensive leather but costs much less.

Leather with these advantages is Diefenthaler's soft and pliable hides, and we guarantee that no oil will come out.

Made specially for carriage and automobile trimmings.

We will send sample hide for your approval without charge.

JOHN V. DIEFENTHALER

Hamilton, Bruen and McWhorter Sts.
NEWARK, NEW JERSEY

Hotel Cumberland NEW YORK CITY

Broadway at
54th Street



**A Real Home
Luxurious
Comfortable**

Absolutely Fireproof

Hardwood floors throughout, covered with genuine oriental rugs, is a feature of the Cumberland which indicates the character of the entire establishment. Rare attention to homelike details eliminates the usual hotel atmosphere. Yet there is retained all the charm of hotel life—provision for every want immediately at hand, and at prices within the limits of the average income.

The Cumberland is within

A few steps of surface cars, elevated and subway. Eight minutes' ride of the best shopping districts. Ten minutes' walk of twenty theatres.

"Broadway" cars from Grand Central Depot pass the door.

Rooms with bath, \$2.50 per day. upwards

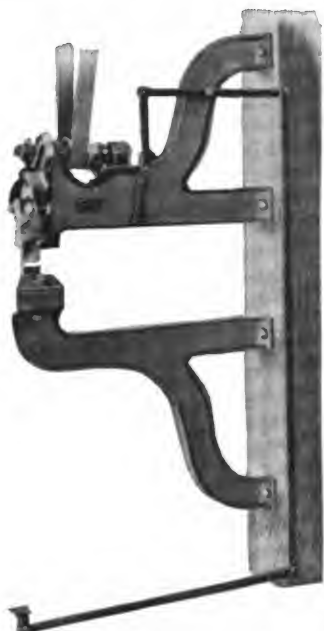
Write for Booklet To-day.

HARRY P. STIMSON, Manager

METAL BODY MACHINERY

of PETTINGELL PATENTS forms the largest, if not the entire equipment of most every automobile body plant in the United States. This surely denotes superiority of the Pettingell line. These machines are also extensively used to do first class work in getting out body stock and frame work.

WRITE FOR CATALOGUE



NEW AUTOMATIC POWER HAMMER

Designed and made especially for Aluminum or Metal Body Work; gives plenty of room to form or turn body panels, seats, wide backs, etc. Is designed and built to run at a high rate of speed, and the peculiar construction with springs and belts preserves the bearings, pins and screws from racking or breaking.



IMPROVED METAL ROLLER FORMER.

A solid, substantial machine, all metal, with cut gears. Will make any curve or various irregular curves on Mud Guards, Metal Panels, Seats, Etc.



HAND MOULDING OR BEADING FORMER.

Will form moulding or beading any size or shape, cuts all metals, will fold in wire around edge of metal and turn over flanges, etc. Intended for use in factories and shops where small machines are needed for much of the work that can be done quicker and easier than on large power machines, and also for many shops where they have not power or facilities or do not wish to put in the large, powerful and more expensive machines.



POWER MOULDING OR BEADING FORMER

A big improvement over any machines formerly used for forming, beading or moulding; cutting all metals; turning over flanges or folding in wired edge of metal, or any part of the work, and combines three machines in one. Adjustable every way and quickly changed for any work. Designed and built to handle all kinds of metal, aluminum, sheet steel, copper or tin.

THE PETTINGELL MACHINE CO.
AMESBURY, - - - - - MASSACHUSETTS

Please mention "The Hub" when you write.



MAYO RADIATORS

Have succeeded simply because they are made on the level, sold on the level and because everybody knows it.

THE MAYO RADIATOR CO.
NEW HAVEN, CONNECTICUT



Please mention "The Hub" when you write.

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

JANUARY, 1912.

No. 10.

Foreign Motor Body Designing

Striking Exhibits of the Trend of Best Foreign Styles Gathered by
The Hub's English Representative, Mr. Thomas Mattison, at Olympia.

(Illustrations and Descriptions Concluded in February.)

The rapid improvements in engine development, and the keen competitive rivalry in the design and construction of motor bodies, have compelled a common pitching ground for an annual exhibition at which "the world and his wife" may see the point that these up-to-date improvements have advanced to, and purchase accordingly.

The show at Olympia drew forth the finest talent in up-to-date engineering and motor carriage building that the British manufacturer could produce.

To keep The Hub's subscribers posted in motor body advancement the editor commissioned its representative in England to obtain if possible photos of the bodies from the exhibitors at the Olympia individually.

The firms applied to most generously responded with highly finished photos of their exhibits which we reproduce herewith and for which the editor of The Hub thanks them.

To Englishmen in the carriage building trade it is most cheering and inspiring to see the grand old coach building firms adapting themselves to the motor carriage industry, with that striking individuality that so signally characterized their work in horse traction carriages, and for which they were so famous all over the world.

In describing the exhibits, we accentuate the position of Barker & Co., Ltd., of 66-68 South Audley street, London, W. They are the oldest coach builders in London, and the designers and builders of the famous "Barker Brougham." This firm has been established for over 200 years, are coach builders to H. M., the King, and the oldest carriage builders to the English court.

No. 1 shows Messrs. Barker's chief exhibit of a double cabriolet. It will be seen that the design of this body is eminently Barkeresque in its heavy quarters, and massive loftiness so characteristic of high class London carriage building.

The back quarter is in plain panelling with round corners and fitted with hinging up luggage platform. The controlling lines of the body are very rich in their curvature, and space the body in fine proportion. The belt line of the body is in flowing return curves, to which the window lines harmonize. A spacious side light is obtained at the back quarter into which the glass frame drops. The door is also spacious, and shows a good light in its glass frame, which is of advantage when the head and extension are up. The half hood and canopy are of fine mechanism, and can be adjusted to position by one man in a few minutes. The body is mounted on Rolls-Royce chassis.

No. 2 shows the body opened out, from which it will be seen how compact and rich a design this car is. In the general designing of high-class motor bodies the "Barker Brougham" lines

and build have been liberally drawn upon for inspiration by designers, which to the varying weaknesses of human nature, is both annoying and extremely flattering.

Messrs. Cole & Sons, Ltd., of Kensington, London, who have been established over one hundred years, exhibited three cars whose design and finish bore out the high reputation of this firm as motor body builders.

No. 3 shows a cabriolet-torpedo body on Benz chassis, 20-30 H.P. The body is massive and heavily quartered behind. The front quarter being cabriolied, a belt panel cuts up the depth of the side. The chauffeur's seat, elbow line and the bonnet pillar line are made to harmonize in their rise, and so act as relief points to the massive panelling.

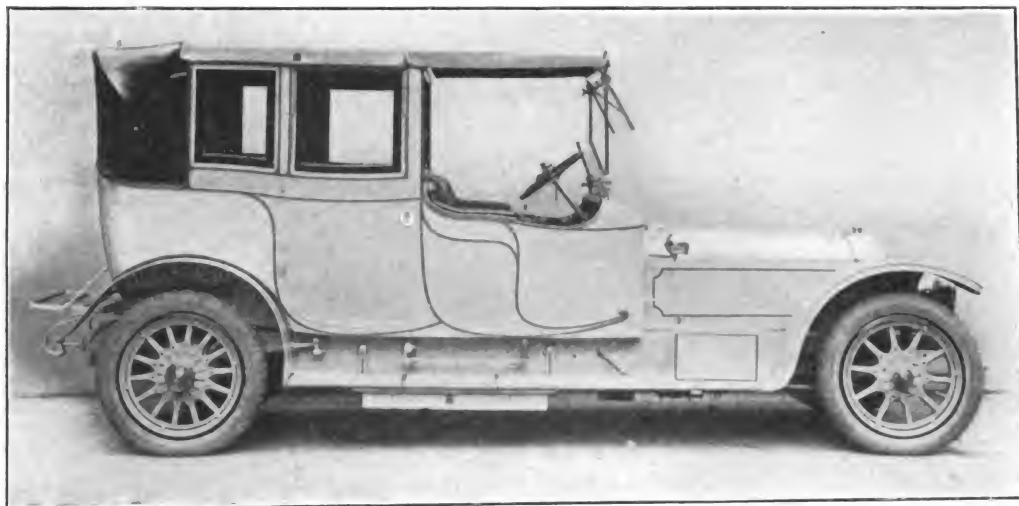
The controlling line of the cabriolet quarter is very graceful and blends evenly into the bottomside line. The body is level-sided and fitted with half hood and full canopy. The body is spacious and a telling break-away in torpedo design. The painting a rich brown.

No. 4 shows a cabriolet body with very light front quarter, so that the entry may be more spacious. The lines are firm and graceful. The car is shown open, with the head fittings in resting package, and the quarter light dropped into its casing. The body is mounted on DeDion chassis; painting in rich blue, and trimming drab with accessory fittings to match.

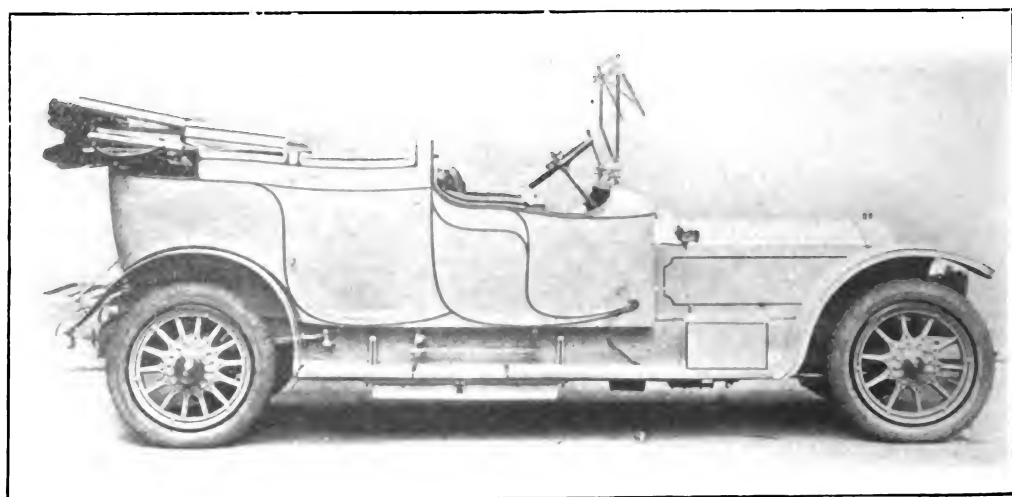
No. 5 is a very handsome car, a landaulette-limousine body on 20 H.P. Vauxhall chassis. The design shows a thorough grasp of the art of motor body building, and an individuality only to be found where brains predominate. The body shows no sectional cutting, but is bounded with full individual controlling lines, which are difficult to harmonize without the help of sectional surfaces to cut up the plane. On this design Cole & Son succeeded in producing one of the handsomest cars seen in the exhibit. The car is interior driven, the painting pea green; glass frames of gray wood; the interior trimming drab cloth and leather, while the wood surfaces were black polished.

Sir William Angus-Sanderson & Co., Ltd., of Newcastle-on-Tyne, were exhibitors of very high class cars of special design. This firm was founded in the latter part of the eighteenth century and has therefore an old and high reputation behind it as carriage builders. And like most of the old established firms in the trade, they have now gone seriously into the designing and building of motor bodies. The exhibits at the Olympia contributed to the show's vehicular success.

No. 6 shows an original design of a special Newborough saloon-limousine body, mounted on 40-50 H.P. Rolls-Royce chassis. To apportion and proportion such a length of body re-



No. 1.
DOUBLE CABRIOLET
 (Closed Body.)
BARKER & CO., LTD.
 London, England

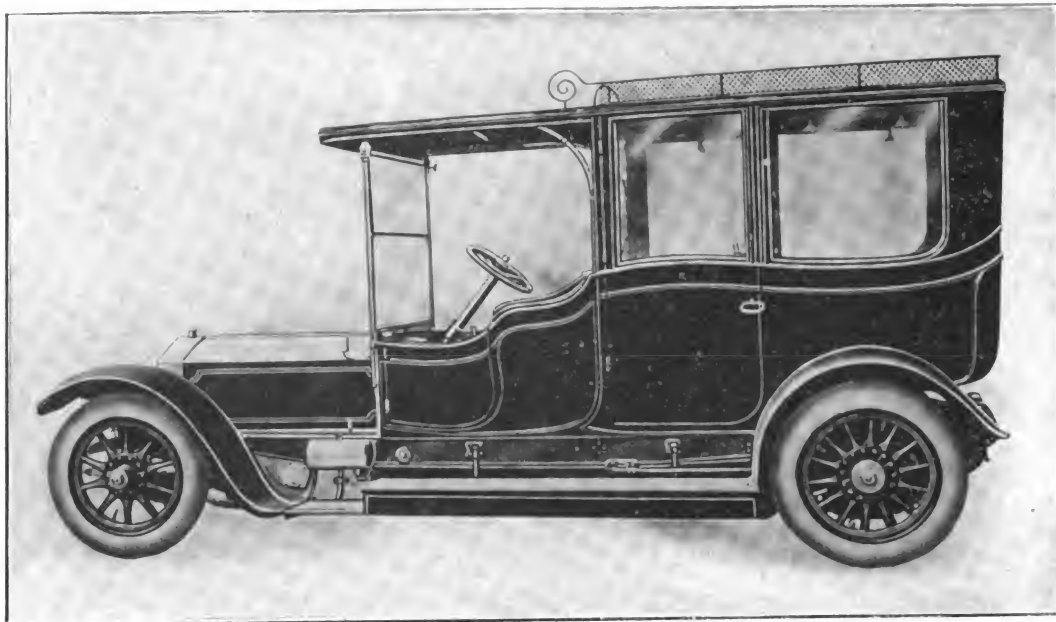
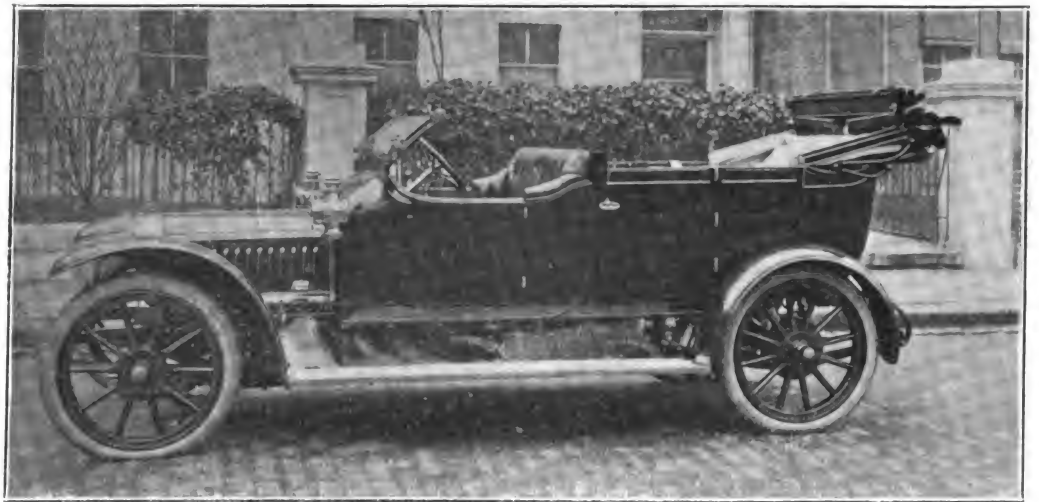


No. 2.
DOUBLE CABRIOLET
 (Opened Out.)
BARKER & CO., LTD.
 London, England



No. 3.
CABRIOLET - TORPEDO
COLE & SONS, LTD.
 Kensington, London, Eng.

No. 4.
CABRIOLET
(To Open and Close)
COLE & SONS, LTD.
Kensington, London, Eng.

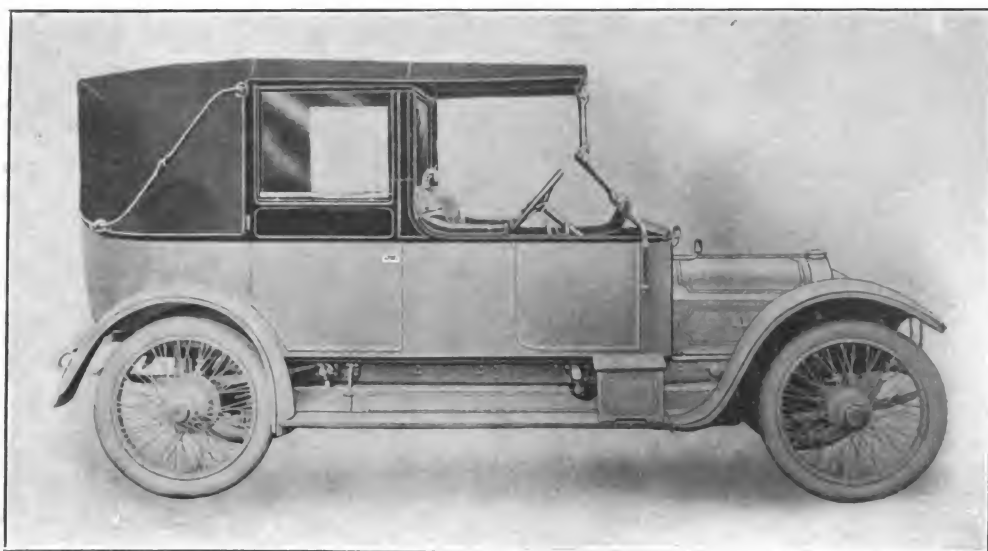


No. 5.
**LANDAULETTE-
LIMOUSINE**
COLE & SONS, LTD.
Kensington, London, Eng.

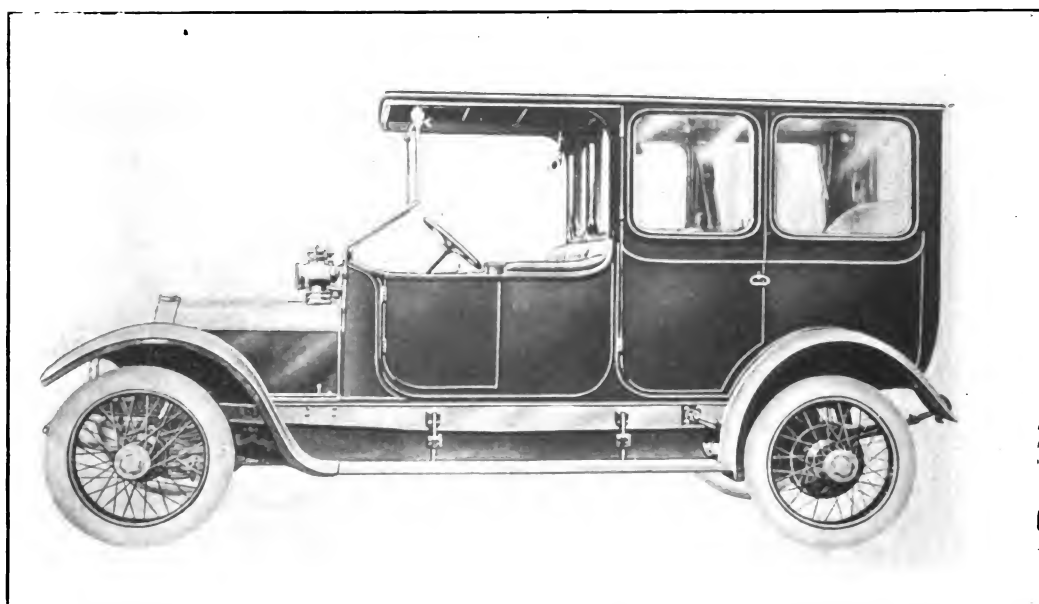
No. 6.
**NEWBOROUGH
LIMOUSINE**

Sir Wm. Angus-Sanderson
& Co., Ltd.
Newcastle-on-Tyne, Eng.

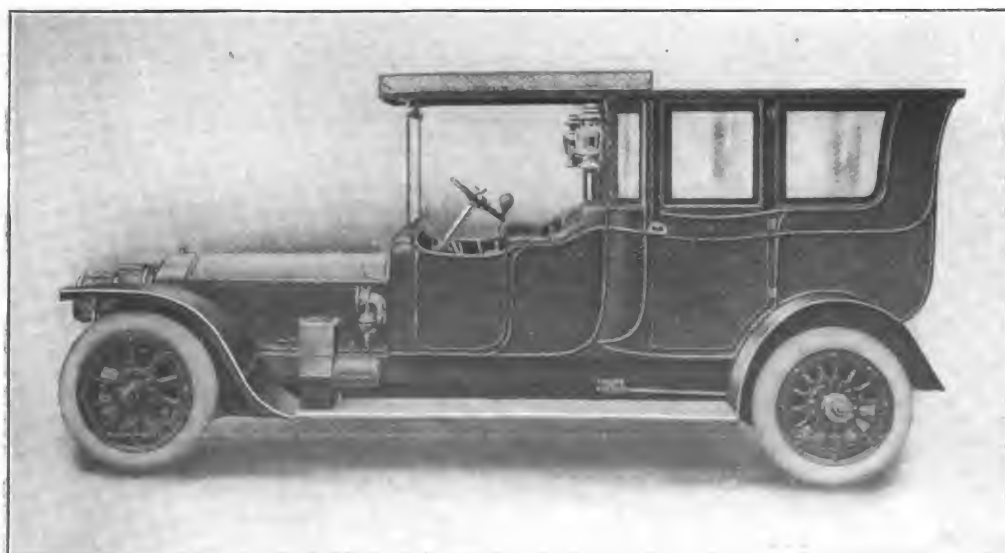




No. 7.
ELSWICK CABRIOLET
 Sir Wm. Angus-Sanderson
 & Co., Ltd.
 Newcastle-on-Tyne, Eng.

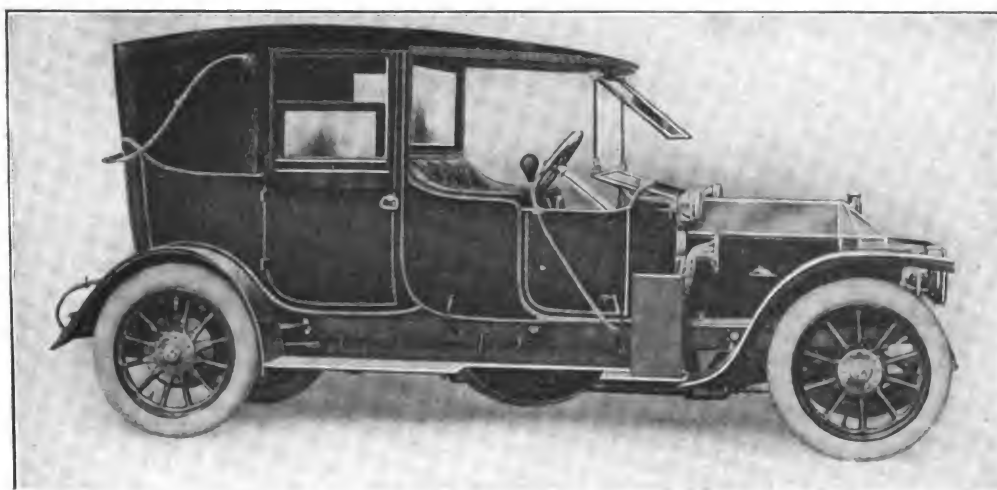
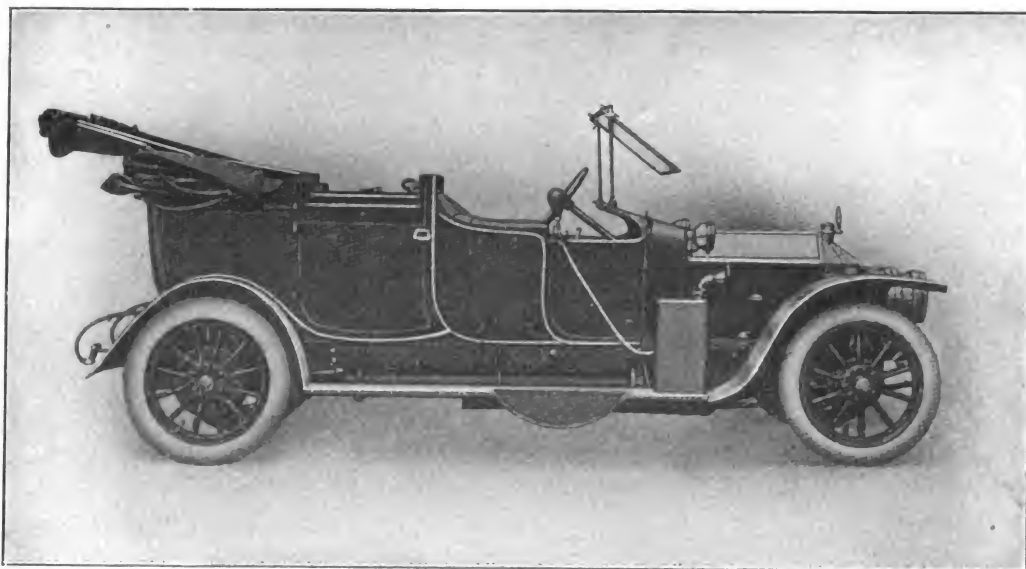


No. 8.
**LIMOUSINE-
 CABRIOLET**
 Sir Wm. Angus-Sanderson
 & Co., Ltd.
 Newcastle-on-Tyne, Eng.



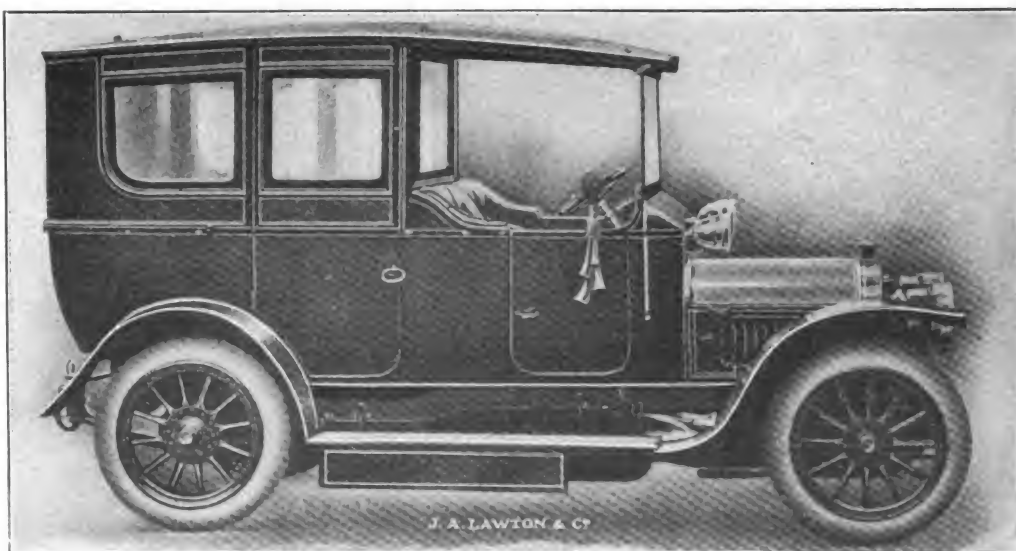
No. 9.
**STANLEY TRIANON
 LIMOUSINE DE LUXE**
 J. A. LAWTON & CO.
 London and Paris

No. 10.
DEFENDER CABRIOLET
J. A. LAWTON & CO.
London and Paris



No. 11.
DEFENDER CABRIOLET
(Closed.)
J. A. LAWTON & CO.
London and Paris

No. 12.
**"EN TOUT CAS" FULL
LIMOUSINE**
J. A. LAWTON & CO.
London and Paris



quires a free use of lines to harmonize the surfaces. The curve and return curve of the body's belt panel has the effect of stealing depth, and so gathering proportion to the door and back quarter in relation to the top quarter, while the ogee line of the corner pillar moulding has the effect of shortening the length of the back bottom quarter. The front quarters are cabriolated and fitted with windage doors. The blending of the lines as a whole succeeds in producing a very handsome motor vehicle on original and subtle lines. Painting black throughout, edged with a fine line of white; trimming of delicate shade of fawn cloth, with perfectly matched silk laces and other trimmings. Interior fittings all of real mother of pearl and silver. The two extra interior seats made to face forward or with back to chauffeur, and are of beautifully polished walnut. Inside fitted with electric light, speaking tubes and usual companions, thus feeding the highest sense of artistic luxury.

No. 7 shows a very roomy and smart torpedo-phaeton body. It is plain in the panelling, but rich; fitted with half hood and canopy. The body being long, gives it a rakish cut, which adds to its smartness. The body is mounted on Armstrong-Whitworth chassis of 15-20 H.P. The car is painted gray, relieved with green mouldings, and upholstery in green leather. A special wind screen is fitted, which also forms the scuttle dash, thus

is a fine example of what is worth doing is worth doing well. The designs of the cars exhibited at the show, and which we give here, speak for themselves, and show the excellence of this firm's motor carriage products.

No. 9 shows the "Stanley" Trianon limousine-de-luxe. It is fitted with circular windows in front. The curvature of the body is full of harmony in embodying the characteristics of the cabriolet, and Brougham. A full ogee curve on the back of the body gives an extended length of roof. The ogee curve, or as it is sometimes called "Hogarth's line of beauty," requires subtle handling in body designing, and the lines of this limousine show that Lawton & Co. have employed it to the fullest artistic advantage. The hind body has accommodation for five passengers, and two in the front quarter.

No. 10 shows the "Defender" cabriolet. The body is designed on Georgian lines, a period striking rich in the production of open phaetons with and without hoods. This smart car is designed for all weathers.

No. 11 shows a "Defender" cabriolet open. The lines of this body are a combination of the brougham and the victoria, and is most suitable in all weathers.

No. 12 shows a full limousine, or as the builders name it, the



NO. 13.—CANOPIED TOURING CAR.
J. A. Lawton & Co., London and Paris.

giving the occupant much greater comfort in driving, and greatly assisting the ventilation, as it can be fixed at any angle.

No. 8 shows a limousine-cabriolet body. The proportions are nicely balanced and the lines appropriate to the fashioning of a saloon body such as this handsome design shows. The hind quarters are deep and massive, while the top quarter and door lights are spacious and in character with the purposes for which the car is meant to cater. The front quarter is cabriolated, the elbow being curved and harmonized to match the belt line of the body. Painting gray, all above the elbow line black; upholstery in beautiful gray cloth with silk laces to match.

It is a gratifying feature in the exhibits of Sir William Angus-Sanderson & Co., that their designs are their own, and entirely original. The details and finish throughout were superb and no expense whatever was spared to make these productions meet the highest expectations of them. This firm is a very earnest technical educationalist, which again reflects itself in its high class products.

Messrs. J. A. Lawton & Co., of London and Paris, were prominent exhibitors at the Olympia. This firm has, from very small beginning risen to the front rank of British carriage building by the sheer influence of the high character of work and

"En tout Cas" limousine. This luxurious car is designed in the doors and top quarters on the lines of the old Clarence, and makes a splendid winter touring car.

No. 13 shows a canopied touring car with the canopy up and extended. The body is of plane surfacing with round back corners. The back and front quarters have short elbow rises which gives a snug and compact appearance to the seating accommodation. The canopy is fitted with side curtains, which can quickly be brought into use when the weather demands enclosure.

The designs that The Hub have been able to place before its subscribers are typical of the leading houses in British motor carriage building, and representative in the highest degree of the exhibits at the Olympia show.

During the last two decades technical education has been gradually eating itself into the hands of English coach making, and thus adding strength to the cunning of the workman's handicraftsmanship. It is education that makes the soldier and quickens his impulses to the word of command and initiative, and it is this lever that traces the art lines in a design and gives deftness to the use of the tools in working it into a living commercial force in meeting the competition of the world, on a common basis, and in an open field.

New York Automobile Shows

The Madison Square Garden Passenger Cars an Instance of Gilding Refined Gold—The Sandpaper and File Era.

In lots of instances, general and special, the Garden show is the best ever, but it is far from being new or novel. It is merely the expression of refinement of manufacturing processes, already established. The cars have been most elegantly and effectively tinkered, prices have been made to yield more of satisfaction for values offered, and the makers are now working through the medium of the magnifying glass by sandpapering into degrees of greater refinement all manufacturing details. This refers most particularly to the mechanics of the subject.

In the top hamper, the painting and trimming of the bodies, as well as the designing, it is plain the schoolmaster has been abroad. It is true there is no distinction of style, no originality of design, but the copies that have been made have been well made and are sure to afford comfort to the passengers.

If it can be said that there is a keynote, it is standardization. The art has approached a dead level of higher excellence, with everyone copying every other in paint, cloth, and drafting, and all turning their eyes to Europe with that imitation which is called the sincerest form of flattery. But it is always better to look up than to look down.

The salient point is the painting and finishing. The tones are subdued and agreeable. There is a range of French greys, "battle-ship" greys, and other shades of grey difficult to name because they conform to no color-mixing scheme that has any names with which we are familiar. They are picked out with narrow or broad lines of white, red and other contrasting colors. In most instances the painting is well done, and the finishing first rate, showing the influence of good varnish.

One exhibitor has gone in strong for the "coronation" purple combined with black. A curious circumstance is noted in the "roadsters" that are displayed by nearly all makers. They could be said to be made from one design so close is the family likeness, and they are nearly all painted in red, and pretty nearly the same shade of red. It makes the observer wonder if this could be a mere coincidence.

Quite the nicest stunt of this kind is to be found on the metal bodies of the Knox cars. A capital imitation of Circassian walnut, mahogany, rosewood, and birds-eye maple is due to the skill of their painter. We never saw more effective graining; and it was an enjoyable relief. The shows are getting to be more and more coachlike in the designing and painting. In the limousine and other enclosed work lakes, blacks, and greens were most in evidence, picked out with the correct contrasting colors. The cars are getting to look quite like a gentleman's pleasure carriage. Some few bodies carried the name plates of known builders in the body building branch of the vehicle industry, but it is fair to presume that most of the improvement is due to the draftsmen that have been so extensively drawn from the Technical School for Carriage Draftsmen so long encouraged and sustained by the Carriage Builders' National Association.

The springs supporting the bodies were almost always semi-elliptic in front and three-quarter in the rear. The long half elliptic for rear suspension was only infrequently seen. The Packard and the Thomas have strengthened the rear springs by three short bottom leaves that separate slightly from the body of the spring except at the clip. We infer that there may be an additional shock-absorbing quality in this practice.

The trimming was a riot of Bedfords, whip cords and broadcloth in drabs and mixed colorings, with a sprinkling of

broadcloths where the trimmer waded deeper into the elegance of the details. The unclosed bodies ran to leather, or leather front seat and cloth rear seat upholstery, and all very well done. The trimming laces were harmonious and always of good quality. Some of the leather could have been much better. In the higher priced cars the interior spare seats were highly evolved affairs with arm rests, well-stuffed seats, which looked as if they would make their occupants quite comfortable, but there are yet plenty of the camp stool order, which on long journeys must be as uncomfortable as the "anxious seat" reserved for repentant sinners.

A few bodies had the roof ventilation, after the omnibus styles. All the touring cars were flush-side models which made the sameness monotonous. The right side fore-door was almost invariably cluttered with tire cases and brake levers, making it look a foolish construction, as symmetry would not have been smothered if the flush side had continued minus a right door.

The Simplex indulged in double running boards, making two steps to enter the body. As it was equipped with 42-inch wheels this was good practice. The American was the only other 42-inch wheel chassis we saw. The larger wheel seems to be looming up. It is such a decided advance and so desirable for comfort and economy of tires that we presume there will soon be a wave of enthusiasm in that direction. The trade seems to have the "flocking together" instinct strongly manifested.

We believe it a fair statement that there was nothing whatever original shown in body design, and this is probably a matter for congratulation, as any breakaway from a safe conservatism would probably have been a freak.

Mechanically the file and the sandpaper did their perfect work. The power plants were highly evolved with the greatest attention to details. You could have right or left drive, outside, inside or center inside brake and change-gear levers, or a combination of both with forceful arguments by polite salesmen to show you why each way was the best practice. The Reo had its change gear lever standing upright, and working on a kind of circular action with name plate on floor showing what each position meant. It was named the center control.

Wind-shields, as a rule, were smaller, that is lower, and wheel bases have lengthened, making it more of a steerman's job than ever to warp the ship in a narrow street without putting out kedge anchors.

The Locomobile changed the touring order by stowing the tires at the back, and fitting good sized trunks to the running boards on each side.

There were two 2-cycle engines displayed, the Amplex and the Elmore. They were the shadows of coming events, and the Knight sleeve engine is the apostle that is pointing the way.

There were three Knight engines—Stearns, Stoddard-Dayton, and Columbia—and the crowd "featured" these exhibits. In other issues we have fully gone into the details of the "sleeve" design, Knight and others. The working models were fumbled by the visitors with the utmost curiosity and apparent interest. It looks as if the contact valve would have quite a line of stumps to hoe to maintain its standing.

The other feature was the self-starter, which has become an infection. It can be had in all kinds of power, compressed air, gas, mechanical and what-not. The word was—"you press the button and it will do the rest." There are yet remaining some con-

servatives who affirm that there is not one that is worth consideration after exhaustive trial of all, others who take the same view, but will install it at owner's risk, and others who show that it has been tried and found wanting in most expensive fashion by European makers of high standing, but it is the fad and you can have it on the machine from a few pounds up to a few hundred in weight, and be certain to have something that will start up the engine every time, except when it fails to do it. The Studebaker Corporation says there is not yet one that is worth a tinker's dam, which is the most worthless of dams. Coffin of the Hudson, the man quoted as being the top-sawyer of all the engineers, says the one he has is "the goods." We do not assume to decide when the doctors disagree, but the last word is self-starter, unless it is "Silent Knight."

The ladies seem to be enthusiastic on such details—all de-

tails. One salesman was explaining in the writer's presence the uses of a dynamo that was useful for keeping the electricity up to its work when wanted, and a moment after the fair one passed on the information to an inquiring sister in this fashion (reported verbatim): "This little thingamajig here, I forget the name, keeps the battery charged all the time. Oh, see the fan, what a pretty shape. Well, I must run." It can be plainly shown from the incident that the show is really educative, though for some of the fair sex the learning is cut on the bias.

All in all the show is a fine one, as we have stated, and the following week devoted to commercial trucks and deliveries bids fair to be as interesting in its way. It will have consideration in the February issue. The attendance was very large.

A consideration of the accessories will be left for the next issue, also.

THE GRAND CENTRAL PALACE SHOW.

The Mecca for Makers Who Can Live Without Notoriety, but Must Have Value for Expenditure.

This was a show in a brand-new building made for show purposes, in a show locality, and a showy affair it was. Three of the 12 floors of the building were needed, if half a third floor is counted that was used for the refreshment of the internal combustion human engine, that needs its charge of gasoline so often, depending on the reputation of the engine.

The building is much better adapted for the purpose than Madison Square Garden, if the traveling from floor to floor is not thought objectionable. There were plenty of elevators at all corners of the structure and the service was as bad as it needed to be. The top floor was the especial reservation of the accessory men. They didn't look so uncomfortable as those in the Garden stalled down in the basement of the place, where the horses this show is trying to displace have their home when they occupy that structure.

The F. I. A. T. was placed in the crown of the setting as the gem of chief value in the ornament. It was the first exhibit to attract, and in price and class was the Mount Hood. The other fellows were on the plains way down below.

What fastened the attention was the splendid character of the exhibits of medium price. The development has been very rapid and most encouraging to anyone wishing to see progress; much more noticeable than in the pretentious cars. With \$900, a buyer could buy as much car as ought to satisfy even a critic who knew what he was talking about. On the \$1,200 level there is nothing in style, finish, and apparent worthiness of work that would not match up with the \$2,000 luxuries of the Garden.

The F. I. A. T. now made in this land, as a mechanism of most superior finish, and extraordinary strength of parts, makes the chassis of a pretentious concern that advertises itself as "dominant," look amateurish.

There was more of the full elliptic rear spring suspension at this show than elsewhere. There were other genuine vehicle builders, builders who had been such before some of the others were commercially born. In the improvements that had been thought out and applied there was more knowledge of what a vehicle does on the road in every day use, than is found in the theorizing mind. These are some of the reasons why the user will get so much more for his money.

In the engineering end there was no originality whatever in the pleasure cars. The art as it is most generally practised is the means adopted to engine the running parts. It is probable that the majority of the cars were assemblages drawn from the storehouse of skill and versatility of the accessory makers, and

the puzzle matched up as well as the price asked would admit of.

The Paige-Detroit suspends the body on a cross full elliptic at the rear and gets a most uncommon good, soft-riding, non-swaying effect. Ford was smiled at for his doing this same with a half-elliptic of crazy looking curves in the same place, but all laugh best who laugh last, and do not have to make continuous experiments called "models."

R. C. H. has found that by depressing the rear full elliptic at rather sharp angles from the level that he gets a construction that makes the road bumps much more endurable. Regal has carried the underslung suspension to the point of getting a very low body, remarkably so, that makes a most convenient car for the passenger, and one that ought not to spill out the passenger when going at speed. It looks well, too.

The Firestone-Columbus, the alias of the Columbus Buggy Co., when it is making motor cars, had a most interesting exhibit of gas and electric cars. Designs good, finish excellent, and mechanical parts well wrought as to detail and finish.

Velie, Cole and the class of real vehicle builders had nothing to excuse in what they had builded to sell. Right through, the improvement in looks of cars marks a big step forward.

This show being a mixture of pleasure and commercial work, a consideration of the latter holds rather the largest end in the interest. Here the range in price was from \$6,000 to \$500, substantially, and there was value all along the line.

The big French truck, the Aries, with its steel-tired wheels and 7 tons capacity, looked business all the way through. The French government has found that this wagon with its slow, long stroke motor, after five years of testing, will do its daily stunt at a cost of a fraction over 2½ cents per ton mile. The steel-tired wheels are guaranteed for sixty thousand miles of service, which must make others scratch their heads and think.

The English-American, or American-English Commer, whichever way your patriotism likes it best, was next in the limelight. It is one of the most thorough jobs of mechanism on the floor. In the treatment of the change speed lever, it has all the particulars of the others done to a finish. As it costs more than \$4,000 to have a look at it, it does not seem fascinating to many besides the very rich brewers and others who have already "got their's," so that they can afford to economize at a high first cost.

The Gramm "fleet" looked good, but as Mr. Gramm himself is such an efficient publicity bureau, it is hardly necessary to supplement his able efforts by more of the same. But it needs

something more solid than water to float off to a private owner one of his 'fleet.'

There was an important sprinkling of air-cooled motors, and friction drives among the lighter wagons shown, and the makers are getting on to the fact that a three two-cycle motor will outwork any six four-cycle. They will go to this stronger in a not distant day. The Chase was one of the exemplars of the air-cooled, high-wheel running gears, and they had a good record to show. Around this town we have personally noticed that they do make some of the other kind look very feeble in times of stress. In very cold weather they do not have to carry a blanket for the radiator as well as for the driver, as if it was one of the despised horses that has to be blanketed whenever things come to a full stop.

The Brooks was the interesting novelty. They say it is the goods, but we only quote the statement, as we have no knowledge that would be even theoretically applicable. It is a two-cylinder, two-cycle engine with the cylinders radiated by a multitude of brass or copper spikes in imitation of the "fretful porcupine." The whole apparatus, magneto and all, is suspended just forward of the rear wheels on a shaft that is turned by the revolutions of the engine. At the outer end of the shaft are gears that engage one of two friction circles of different diameter on the wheels, somewhat like the Duryea roller drive, according as the lever in the driver's seat is shifted. This engagement makes the wheels go round and supplies the propulsion, and that is all there is to it. This direct wheel rim friction is arranged to give two speeds forward and reverse, and the price with body (lowest) is \$500.

The Flint motor wagon department of the Durant-Dort Carriage Co. has its "Best" wagon in evidence, intended for light delivery needs. It is a good looking wagon from any angle, equipped with a two-cylinder opposed engine of the 4-cycle type to yield 18 H.P. The transmission is by means of friction, and it is at this spot they have concentrated their thinking capacity and evolved a suspension that is good enough to patent and they are getting it covered like it was a general blanket mortgage.

The Newark was the only worm-driven rear axle construction in the building, and that worm was cut in England, but it had squirmed off some 5,000 miles of duty in this country and looked good for another indefinite number of miles.

The lasting impression from a consideration of the work-a-day cars is that the merchant is getting some very excellent service offered at varying prices that will fit almost any purse, and if he is still in the hold-off mood, waiting for further developments, that it will not be such a very long time he will have to wait when even the present construction will be more or less obsolete, by the simpler, more efficient still, that will come upon the streets. It is an industry that is in the evolutionary stage. The progress so far made has been remarkable, but there is oceans of room for the original thinker, the man not tied to precedent. At present there is too little thinking, too much struggle lest some of the pie shall get away or be consumed by the other fellow, with the great big dollar looked on as the cause instead of the effect. This will all be changed in good time to the great and lasting betterment of the industry.

AXLE PLANT BECOMES STUDEBAKER'S OWN.

Having fulfilled the conditions imposed by the local Chamber of Commerce, title to the real estate and plant which it has operated in Port Huron, Mich., was vested in the Studebaker Corporation which now owns the property absolutely. The plant originally was occupied by the Northern Motor Car Co., which was taken over by the E-M-F Co., which in turn was absorbed by the Studebaker Corporation. It was employed in producing the axles for the Studebaker cars and has been styled E-M-F factory No. 2. The conditions that have been fulfilled required that the factory be operated for five years and dispense at least \$200,000 per year in wages for five years.

LONDON'S HORSE 'BUS A THING OF THE PAST.

The curtain was rung down on the scene of the horse-drawn omnibus in the streets of London on Tuesday, October 31, and to some old Londoners the end was a tragedy. On the day mentioned every horse-drawn omnibus was cleared from the London roads, thus putting an end to a traffic system whose romantic reign has extended back over a long period of years in the English metropolis. The change from horseflesh to petrol, which was inaugurated in 1904, has been even more rapid in its revolutionary character than the most sanguine prophets anticipated. The first motor-omnibus started in London ran from Peckham to Oxford Circus.

Two motor omnibuses were put upon trial at Hastings, England, to ascertain the actual running cost of such service. During 1909 the expenses of the 'buses averaged 23 cents per mile each. This outlay was cut to 20 cents per mile during the fiscal year ending recently. These 'buses were not, however, of the very latest types and it is estimated that 18 cents per mile will cover the running expense of the most modern pattern of vehicle.

CONVENTION DATES.

Idaho Hardware and Implement Dealers' Association, Boise, Ida., January 11, 12 and 13, 1912.

Western Retail Implement and Vehicle Dealers' Association, at Kansas City, January 16, 17 and 18, 1912.

Pacific Northwest Hardware and Implement Association, at Spokane, Wash., January 17, 18 and 19, 1912.

Oregon Retail Hardware and Implement Dealers' Association at Portland, January 23, 24, 25 and 26, 1912.

Mississippi Valley Retail Implement and Vehicle Dealers' Association, at St. Louis, Mo., January 30, 31, February 1, 1912.

Virginia and North Carolina Retail Implement, Machinery and Vehicle Dealers' Association, at Greensboro, N. C., February 7 and 8, 1912.

Texas Hardware and Implement Association, at Dallas, February 13, 14 and 15, 1912.

North Dakota and Northwestern Minnesota Implement Dealers' Association at Grand Forks, N. D., February 13, 14 and 15, 1912.

Colorado Retail Implement and Hardware Dealers' Association, at Denver, Colo., February 20, 21 and 22, 1912.

REPUBLIC WINS NOBBY TREAD SUIT.

Judge Hazel, sitting in the United States Circuit Court for the Southern District of New York, ruled that the Morgan & Wright production is an infringement of the Tod J. Mell patent under which the Republic tread is produced, and which is controlled by the Republic Rubber Co., of Youngstown, O. The decision is the outcome of the suit filed by the Republic Rubber Co. against Morgan & Wright for infringement of the Mell patent No. 898,907, dated September 15, 1908. In ruling that the patent is valid and though finding Morgan & Wright guilty of infringement and granting the injunction prayed for, Judge Hazel exempted the defendants from costs.

MANY TRADEMEN IN NEW PLACES.

R. D. Rocap, of Kalamazoo, Mich., has been appointed superintendent of the Alpena Motor Car Co., of Alpena, Mich. He succeeds George E. Cately.

A. B. C. Hardy, a former attachee of Durant-Dort, formerly manager of the Marquette Motor Co., of Saginaw, has been appointed general manager of the newly organized Little Motor Car Co., of Flint, Mich. He assumed his new duties on Jan. 1.

George B. Pratt, for several years sales manager for the Dean Electric Co., of Elyria, O., has joined the staff of the Anderson Electric Car Co., of Detroit. He will cover the state of Ohio and part of New York and Pennsylvania.

THE HORRID PESSIMIST.

A reader of *The Motor* went to the Olympia (London) show, and he saw things displeasing, so he became captious in his criticism. We have had so much honey spread over all automobilia that a little of this sort of talk may prove a corrective for the sour taste that always follows too much honey.

"For this is now my opinion of 1912 models (speaking generally, of course, but of finish and detail in particular), and of those responsible for them, viz., that the finish is indifferent in the majority of cases, and very bad in some, that detail in many makes, so far from being improved, has suffered a relapse.

"On one car I saw a mudguard the finish of which would have disgraced any local tinker able to handle a paint brush; the surface was simply hopeless, while one could detect that even the virgin rust upon the raw metal surface had not been removed.

"A firm producing a coupe had staged for inspection their latest word in this design. One would therefore be justified in expecting to find things 'just so,' and evidence of careful thought and labor at every turn; but in point of fact both finish and 'fit' were shocking, one detail being that the gasoline filler (the gasoline tank being incorporated with the scuttle dash) was rubbing right up against a polished mahogany framing which topped the dash; the filler itself embedded in upholstery, and its orifice was no larger than a half-penny in diameter. The whole job spoke eloquently of a 'botchy' lack of design for which there was no earthly excuse, as the filler could have been fitted in any other position just as easily, could just as well have been designed double the size, while it was a perfectly simple matter to have positioned it outside the body instead of interior, which should be reserved for private use, and not laid open to the invasion of grubby gasoline men with unwieldy cans and funnels to knock and damage anything they go near in the way of delicate upholstery and finished surfaces. Yet another point in this vehicle, the chassis of which was practically unchanged from the 1911 model, was that while the brake pedal was placed well away from the steering column, allowing plenty of foot room for its operation, the clutch pedal on the opposite side was in such close proximity to the base of the steering column that it would be possible to put only half the width of one's boot sole upon it.

"But the cream of the detail 'improvement' crusade was to be seen, I think, on the stand of another exhibitor who had staged a vehicle the body of which was fitted with an 'off' side front door—a door, that is to say, which actually provided for ingress and egress in the ordinary way. But any advantage attaching to this praiseworthy attempt on the part of the coachbuilder had been promptly counteracted by the attachment of a spare wheel fitted in the usual place on the running board. The positioning of the arms carrying the wheel brought the latter so close to the body that the handle of this door had apparently dared to dispute its presence; consequently swift retribution had followed, the handle being made such an example, for it hangs its head and endeavors to efface itself as much as possible by cringing flat against the door responsible for its presence.

"So the tale goes on; and the writer, for one, is puzzled to understand how firms can be so blind to their own interests as to neglect these all-too-obvious defects which still await treatment—defects which exasperate the owner all the more by reason of their petty nature, and the ease with which they could be abolished. Why build bodies which enclose the levers by such an inadequate margin that either knuckles are 'barked' every time they are manipulated, or else their action is fumbled? Would another inch or two in this direction ruin the whole vehicle, or its design? I am sometimes constrained to think that the men responsible for this part of a firm's progress are either dispensed with altogether, or need replacing by practical men, for it is undeniable that it is to a greater extent than ever before—now that engine and transmission efficiency have reached their present pitch—the little things that count' with the average prospective purchaser."

TESLA'S NEW MECHANICAL PRINCIPLE.

A digest by the Automobile from the Electrical Review is still further abstracted for the use of our readers so they may keep abreast of new applications of power.

Nikola Tesla has developed a new mechanical principle broadly applicable for the generation, transformation and transmission of mechanical energy. It has been the aim of the inventor to let the energated fluid flow along its natural paths; with as small a friction loss as possible. It is important to keep in mind the fact that in his, like in all other mechanical devices, friction is inevitably equivalent to a loss in efficiency. With these points in view, Mr. Tesla uses in his construction but a few simple and economic elements creating as little resistance as possible for the fluids moving his machine or moved by them.

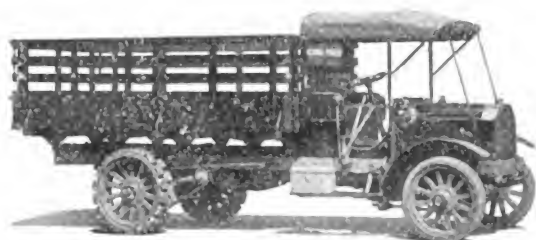
The machine is of simple construction and may be used as a motor or as a pump. In a steel housing, very much like to that of a centrifugal pump, is contained a runner consisting of a number of steel or bronze plates arranged in series upon a shaft. Each plate or disc has three central openings extending from the shaft to about one-third of the radius and separated by spokes. These openings are cut or stamped out of the disc and the surfaces or the latter are kept as smooth as possible.

If the device is mounted on bearings and rotated at considerable speed the following phenomenon takes place. The air, in direct touch with the metal discs, is held to them by molecular adhesion, clinging to the metal surfaces as water does to that of a solid it is brought in contact with, and therefore the air particles next to the discs are imparted motion in the direction of the rotation of the discs. Thus, some air is dragged along and its particles begin revolving about the shaft of the device. Since the movement of the air is rotary, centrifugal force causes it to move away from the central portions of the discs, the resultant between the rotary and centrifugal force being along a spiral line. This flow of air toward the periphery of the discs causes a fall of atmospheric pressure at the central regions, and these being occupied by the openings, air rushes in through the openings, and thus a continuous flow of air is maintained.

The viscosity of air is about 100 times that of water. Thus, the entire body of air between the two discs, unless they are spaced too far—is transported to the peripheral portions of the interdiscular space, and, after having reached the periphery, streams along the wall of the casing until the air reaches the outlet where it is discharged. The quantity of the fluid propelled through this pump, according to tests made by its inventor, is approximately proportionate to the active surface of the runner—the total active surfaces of all the discs on the shaft—and to the effective speed of the machines; therefore, the performance of the pump is bettered with increasing size and number of revolutions per minute.

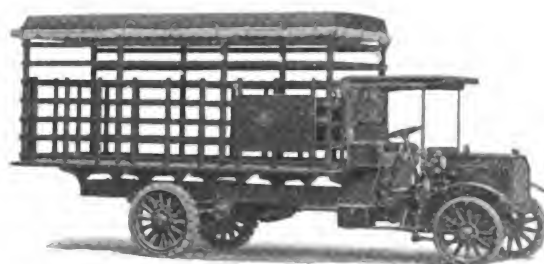
The engine, when driven by a mixture of steam and the products of a gaseous fuel burned in an auxiliary chamber showed 110 horsepower on the brake, and more load could have been sustained by it except for the small dimensioned shaft. While this instance shows that the same machine may be used as a prime mover and as a pump, it is obvious that a machine of this type specially constructed for the purpose of driving machinery may be improved upon by adapting some details to the specific needs of the situation. There is no unsurmountable difficulty in the construction of a light and practical motor of this type for the use of liquid hydrocarbon fuels. An auxiliary combustion chamber and carburetor have to be used in connection with the rotary engine described, and a very small pump to supply the air to the gasoline, if such be used. Mr. Tesla states he has carried out numerous experiments along this line, and by the use of his motor transforms 60 per cent of the energy of the gasoline into mechanical work available at the shaft. This may seem very high, but since with a rotary engine it is not necessary to encounter such vast cooling losses as in common gas engine practice, the high efficiency claimed by him might be obtained even in an average gasoline engine of his construction.

1912



Commercial MOTOR TRUCKS

A Special Department of New Styles in
Motor Propelled Business Wagons



An Illustrated Modern
System of Delivery

1912

LIST OF CONTRIBUTORS

The Adams Bros Co., Findlay, Ohio ...	365	Hydraulic Truck Sales Co., New York	376
American Locomotive Co., (Alco) New York City	368	International Motor Co., (Mack) 30 Church St., New York City	363
Anderson Electric Car Co., Detroit, Mich.	379	International Motor Co., (Saurer) 30 Church St., New York City	362
Atlas Motor Car Co., Springfield, Mass.	375	International Harvester Co. of America, Chicago, Ill.	375
Atterbury Motor Car Co., Springfield, Mass.	371	Jackson Automobile Co., Jackson, Mich.	367
Avery Company, Peoria, Ill.	368	Kearns Motor Car Co., Beavertown, Pa.	374
H. H. Babcock Co., Watertown, N. Y....	375	Kelly Motor Truck Co., Springfield, O.	373
Bowling Green Motor Car Co., Bowling Green, Ohio	376	Knox Automobile Co., Springfield, Mass.	365
The Buckeye Mfg. Co., Anderson, Ind.	366	Mals Motor Truck Co., Indianapolis, Ind.	369
Commercial Truck Co. of America, Philadelphia, Pa. .	378-379	The Martin Carriage Works, York, Pa...	366
James Cunningham, Son & Co., Rochester, N. Y.	376	W. H. McIntyre Co., Auburn, Ind.....	369
Decatur Motor Car Co., Decatur, Ind.	374	Monitor Automobile Works, Janesville, Wis.	372
Durant-Dort Carriage Co., Flint, Mich.	376	Pierce-Arrow Motor Co., Buffalo, N. Y.	361
Federal Motor Truck Co., Detroit, Mich.	375	Peerless Motor Car Co., Cleveland, O.	373
Franklin Automobile Co., Syracuse, N.Y.	371	Schacht Motor Car Co., Cincinnati, O..	375
General Vehicle Co., Long Island City, N. Y.	377	Schmidt Bros. Co., Chicago, Ill.	376
Geneva Wagon Co., Geneva, N. Y. ...	370	Speedwell Motor Car Co., Dayton, O. ..	372
Grabowsky Power Wagon Co., Detroit	370	F. B. Stearns Co., Cleveland, O.	374
Hewitt Motor Co., New York City....	364	Vellie Motor Vehicle Co., Moline, Ill....	367
		The Waverly Co., Indianapolis, Ind....	379

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.

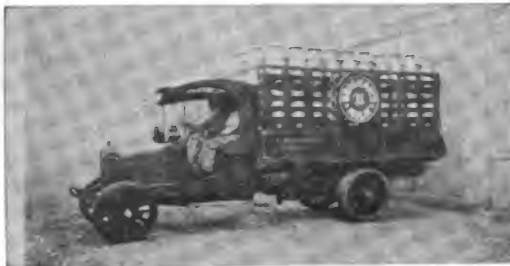


COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.



COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.



COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.

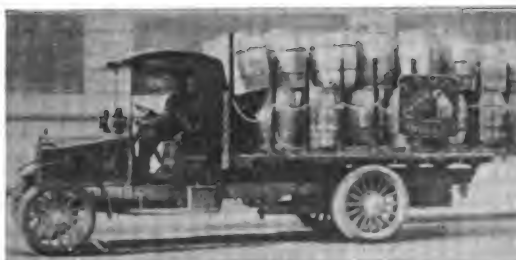


COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.



COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.



COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.



COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.



COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.



COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

PIERCE-ARROW 5-ton Truck.

PIERCE-ARROW MOTOR COMPANY
Buffalo, N. Y.

CAPACITY—5 tons.
PRICE—\$4,500.
CYLINDERS—4-4 7-8x6 in.
H. P.—38.



COOLING—Pump tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—156 in.
TIRES—Front, 36x5; rear 40x6, twin.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Service trans., emergency internal.
BEARINGS—Roller.

SAURER 4½-ton

INTERNATIONAL MOTOR CO.
30 Church St., New York City

CAPACITY—4½ tons
PRICE—\$5,000.
CYLINDERS—4-4 3-8x5½, pairs.
H. P.—37.



COOLING—Pump, cell.
IGNITION—Magneto.
CARBURETOR—Own.
WHEELBASE—153 in.
TIRES—Front, 36x5; rear, 42x5, twin.
SPRINGS—Half elliptic.
AXLES—Front, 1¼x3; rear, 2¼x3½.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—4 forward and reverse.
DRIVE—Chain.
BRAKES—Three.
BEARINGS—Roller.

SAURER 6½-ton.

INTERNATIONAL MOTOR CO.
30 Church St., New York City

CAPACITY—6½ tons.
PRICE—\$6,000.
CYLINDERS—4-4 3-8x5½, pairs.
H. P.—37.



COOLING—Pump, cell.
IGNITION—Magneto.
CARBURETOR—Own.
WHEELBASE—159 in.
TIRES—Front, 36x5; rear, 42x5½, twin.
SPRINGS—Half elliptic.
AXLES—Front, 1¼x3; rear, 2¼x4½.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—4 forward and reverse.
DRIVE—Chain.
BRAKES—Service and trans.
BEARINGS—Ball.

MACK
1-ton.INTERNATIONAL MOTOR CO.
30 Church St., New York CityCAPACITY—1 ton.
PRICE—\$2,500.
CYLINDERS—4-4½x5½ in.
H. P.—32.4.COOLING—Pump, cell.
IGNITION—Dual.
CARBURETOR—Stromberg.
WHEELBASE—126-138 in.
TIRES—Front, 36x4; rear 36x2½, twin
SPRINGS—Half elliptic and platform.
AXLES—Front, 1¾; rear, 1 7-8-2½.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.**MACK**
2-tons.INTERNATIONAL MOTOR CO.
30 Church St., New York CityCAPACITY—2 tons.
PRICE—\$3,000.
CYLINDERS—4-4½x5½ in.
H. P.—32.4.COOLING—Pump, cell.
IGNITION—Dual.
CARBURETOR—Stromberg.
WHEELBASE—126-162 in.
TIRES—Front, 36x4; rear, 36x3½, twin
SPRINGS—Half elliptic and platform.
AXLES—Front, 1¾; rear, 2¼x2½.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.**MACK**
3-ton.INTERNATIONAL MOTOR CO.
30 Church St., New York CityCAPACITY—3 tons.
PRICE—\$4,000.
CYLINDERS—4-5½x6, in pairs.
H. P.—48.4.COOLING—Pump, cell.
IGNITION—Single.
CARBURETOR—Opt.
WHEELBASE—129-168 in.
TIRES—Front, 36x5; rear, 36x4, twin.
SPRINGS—Half elliptic and platform.
AXLES—Front sq.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.**MACK**
4-ton.INTERNATIONAL MOTOR CO.
30 Church St., New York CityCAPACITY—4 tons.
PRICE—\$4,250.
CYLINDERS—4-5½x6, in pairs.
H. P.—48.4.COOLING—Pump, cell.
IGNITION—Magneto.
CARBURETOR—Opt.
WHEELBASE—129-174 in.
TIRES—Front, 36x6; rear, 36x4½, twin
SPRINGS—Half elliptic and platform.
AXLES—Front sq.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.**MACK**
5-ton.INTERNATIONAL MOTOR CO.
30 Church St., New York CityCAPACITY—5 tons.
PRICE—\$4,800.
CYLINDERS—4-5½x6, in pairs.
H. P.—48.4.COOLING—Pump, cell.
IGNITION—Single.
CARBURETOR—Own.
WHEELBASE—129-174 in.
TIRES—Front, 36x6; rear, 36x5, twin
SPRINGS—Half elliptic and platform.
AXLES—Front sq.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.**MACK**
7-ton.INTERNATIONAL MOTOR CO.
30 Church St., New York CityCAPACITY—7 tons.
PRICE—\$5,300.
CYLINDERS—4-5½x6, in pairs.
H. P.—48.4.COOLING—Pump, cell.
IGNITION—Magneto.
CARBURETOR—Opt.
WHEELBASE—129-174 in.
TIRES—Front, 36x7; rear, 36x6, twin
SPRINGS—Half elliptic and platform.
AXLES—Front sq.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

HEWITT 1-ton.

HEWITT MOTOR COMPANY
New York City



CAPACITY—1 ton.
PRICE—\$1,800.
CYLINDERS—4-3¼x4¼.
H. P.—17.
COOLING—Pump.
IGNITION—Magneto.
CARBURETOR—Schebler.
WHEELBASE—106 in.
TIRES—36x3½; 36x4.
SPRINGS—Half elliptic.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.

HEWITT 2-ton

HEWITT MOTOR COMPANY
New York City



CAPACITY—2 tons.
PRICE—\$2,500.
CYLINDERS—2-5½x5.
H. P.—24.
COOLING—Thermo-syphon.
IGNITION—Magneto.
CARBURETOR—Schebler.
WHEELBASE—112 in.
TIRES—34x4; 34x3½, dual, blocks.
SPRINGS—Half elliptic.
AXLES—Square front.
CLUTCH—Cone.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.

HEWITT 3½-ton

HEWITT MOTOR COMPANY
New York City



CAPACITY—3½ tons.
PRICE—Chassis, \$3,500.
CYLINDERS—4-4¼x6 in.
H. P.—40.
COOLING—Pump.
IGNITION—Magneto.
WHEELBASE—128 in.
TIRES—34x3½, 40x4, twin, blocks.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BEARINGS—Timken roller.

HEWITT 5½-ton

HEWITT MOTOR COMPANY
New York City



CAPACITY—5½ tons.
PRICE—Chassis, \$4,500.
CYLINDERS—4-4¼x6 in.
H. P.—40.
COOLING—Pump.
IGNITION—Magneto.
WHEELBASE—140 in.
TIRES—34x5, 40x6, twin, blocks.
GEAR SET—Selective.
SPEED—3 forward and reverse, also
2 speeds planetary.
DRIVE—Chain.
BEARINGS—Timken roller.

HEWITT 7-ton

HEWITT MOTOR COMPANY
New York City



CAPACITY—7 tons.
PRICE—Chassis, \$5,000.
CYLINDERS—4-4¼x6 in.
H. P.—40.
COOLING—Pump.
IGNITION—Magneto.
WHEELBASE—138 in.
TIRES—36x5, 36x7, twin, blocks.
GEAR SET—Planetary.
SPEED—2 forward and reverse.
DRIVE—Chain.
BEARINGS—Timken roller.

HEWITT 10-ton

HEWITT MOTOR COMPANY
New York City



CAPACITY—10 tons.
PRICE—\$5,500.
CYLINDERS—4-4¼x6.
H. P.—40.
COOLING—Pump.
IGNITION—Magneto.
CARBURETOR—Own.
WHEELBASE—138-164 in.
TIRES—36x5; 44x7, dual, blocks.
SPRINGS—Half elliptic.
AXLES—I-beam.
CLUTCH—Cone.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.

KNOX
2-tonKNOX AUTOMOBILE CO.
Springfield, Mass.CAPACITY—2 tons.
PRICE—Chassis, solid tires, \$3,000.
CYLINDERS—4-5x4¼, singly.
H. P.—40.COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Stromberg.
WHEELBASE—145 in.
TIRES—Either solid or pneumatic.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; rear, 3 in. round.
CLUTCH—Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.**KNOX**
3-tonKNOX AUTOMOBILE CO.
Springfield, Mass.CAPACITY—3 tons.
PRICE—Chassis, \$3,700.
CYLINDERS—4-5x4¼, singly.
H. P.—40.COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Stromberg.
WHEELBASE—149 in.
TIRES—36x5 and 36x5, twin.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; rear, 4 in. round.
CLUTCH—Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.**KNOX**
4-tonKNOX AUTOMOBILE CO.
Springfield, Mass.CAPACITY 4 tons.
PRICE—Chassis, \$4,000.
CYLINDERS—4-5x4¼, singly.
H. P.—40.COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Stromberg.
WHEELBASE—149 in.
TIRES—36x6 and 36x6, twin.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; rear, 4 in. round.
CLUTCH—Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.**KNOX**
5-tonKNOX AUTOMOBILE CO.
Springfield, Mass.CAPACITY—5 tons.
PRICE—Chassis, \$4,500.
CYLINDERS—4-5x4¼, singly.
H. P.—50.COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Stromberg.
WHEELBASE—149 in.
TIRES—36x6 and 40x6, twin.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; rear, 5 in. round.
CLUTCH—Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.**KNOX**
6-tonKNOX AUTOMOBILE CO.
Springfield, Mass.CAPACITY—6 tons.
PRICE—Chassis, \$5,000.
CYLINDERS—4-5x4¼, singly.
H. P.—50.COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Stromberg.
WHEELBASE—149 in.
TIRES—36x7 and 42x7, twin.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; rear, 5 in. round.
CLUTCH—Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.**ADAMS**
1-tonTHE ADAMS BROS. COMPANY
Findlay, O.CAPACITY—1 ton.
PRICE—\$2,100.
CYLINDERS—4-3 1-8x5, en bloc.
H. P.—24.COOLING—Pump, tube.
IGNITION—Dual, Eisemann magneto.
CARBURETOR—King.
WHEELBASE—121 in.
TIRES—Front, 36x3; rear, 36x3½.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Ball.

MARTIN F—1,000 lbs.

THE MARTIN CARRIAGE WORKS
York, Pa.

CAPACITY—1,000 lbs.
PRICE—\$1,450.
CYLINDERS—2-4½x5 in.
H. P.—18.



COOLING—Thermo-syphon.
IGNITION—Double.
CARBURETOR—Automatic float feed.
WHEELBASE—94 in.
TIRES—36x2½, solid.
SPRINGS—Elliptic.
AXLES—Front 2¼ tubular; rear solid steel.
CLUTCH—Double disc.
GEAR SET—Planetary.
SPEED—2 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

MARTIN G—1,000 lbs.

THE MARTIN CARRIAGE WORKS
York, Pa.

CAPACITY—1,000 lbs.
PRICE—\$1,650.
CYLINDERS—2-4½x5 in.
H. P.—18.



COOLING—Thermo-syphon.
IGNITION—Dual.
CARBURETOR—Automatic float feed.
WHEELBASE—98 in.
TIRES—36x3, solid.
SPRINGS—Front, elliptic; rear, plat.
AXLES—Front, 2¼ tubular; rear, rd.
CLUTCH—Multiple disc.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

MARTIN J-2—1,000 lbs.

THE MARTIN CARRIAGE WORKS
York, Pa.

CAPACITY—1,000 lbs.
PRICE—\$1,400.
CYLINDERS—2-4½x4½.
H. P.—16.



COOLING—Thermo-syphon.
IGNITION—Dual.
CARBURETOR—Automatic float feed.
WHEELBASE—94 in.
TIRES—34x2¼ in.
SPRINGS—Elliptic.
AXLES—Front, 2½ tubular; rear, rd.
CLUTCH—Multiple disc.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

MARTIN K-4—3,000 lbs.

THE MARTIN CARRIAGE WORKS
York, Pa.

CAPACITY—3,000 lbs.
PRICE—\$3,000.
CYLINDERS—4-4½x5 in.
H. P.—36.

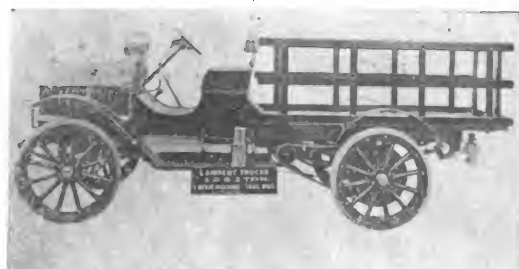


COOLING—Pump.
IGNITION—Magneto.
CARBURETOR—Automatic float feed.
WHEELBASE—118-124 in.
TIRES—Front, 36x4; rear 40x4.
SPRINGS—Elliptic.
AXLES—Front, 2½; rear, 2½.
CLUTCH—Multiple disc.
GEAR SET—Selective or planetary.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

LAMBERT 1-ton

THE BUCKEYE MFG. CO.
Anderson, Ind.

CAPACITY—1 ton.
PRICE—\$1,600.
CYLINDERS—4-4½x4½, en bloc.
H. P.—27.3.

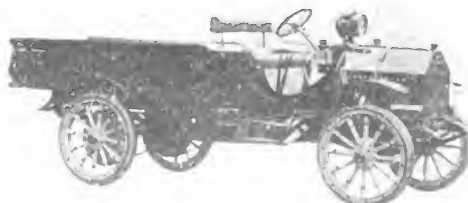


COOLING—Pump, tube.
IGNITION—Dual, Remy magneto.
CARBURETOR—Schebler.
WHEELBASE—120 in. or to suit.
TIRES—Front, 36x3; rear, 36x3½.
SPRINGS—Half elliptic.
AXLES—Front, 1-beam.
GEAR SET—Friction.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.

LAMBERT 2-ton

THE BUCKEYE MFG. CO.
Anderson, Ind.

CAPACITY—2 tons.
PRICE—\$2,000.
CYLINDERS—4-4½x4½, en bloc.
H. P.—35.



COOLING—Pump, tube.
IGNITION—Dual, Remy magneto.
CARBURETOR—Schebler.
WHEELBASE—138 in. or to suit.
TIRES—Front, 36x3½; rear, 36x4.
SPRINGS—Half elliptic.
AXLES—Front, 1-beam.
GEAR SET—Friction.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.

**VELIE
Delivery**

VELIE MOTOR VEHICLE CO.
Moline, Ill.

CAPACITY—1500 lbs.
PRICE—\$1,600.
CYLINDERS—4-4½x5¼ in., pairs.
H. P.—40.



COOLING—Honeycomb radiator and large fan.
IGNITION—Double Splitdorf and Atwater-Kent, 8 spark plugs.
WHEELBASE—115 in.
TIRES—34x4.
SPRINGS—Half elliptic, 38x2 front, 46x2 rear.
AXLES—Front, I-beam; rear, Timken full floating.
CLUTCH—Three disk.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Hand emergency and foot service.
BEARINGS—Timken roller.

**VELIE
1½-ton**

VELIE MOTOR VEHICLE CO.
Moline, Ill.

CAPACITY—1½ tons.
PRICE—Chassis, \$2,850.
CYLINDERS—4-4½x5¼ in., pairs.
H. P.—25.6.

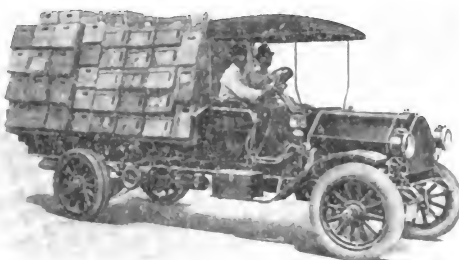


COOLING—Pump, cell.
IGNITION—Double.
CARBURETOR—Stromberg.
WHEELBASE—148 or 172 in.
TIRES—Front, 36x5; rear, 36x3½, dual.
SPRINGS—Half elliptic, 12 leaved.
AXLES—Front, I-beam.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

**VELIE
1½-ton**

VELIE MOTOR VEHICLE CO.
Moline, Ill.

CAPACITY—1½ tons.
PRICE—Chassis, \$2,850.
CYLINDERS—4-4½x5¼ in., pairs.
H. P.—25.6.

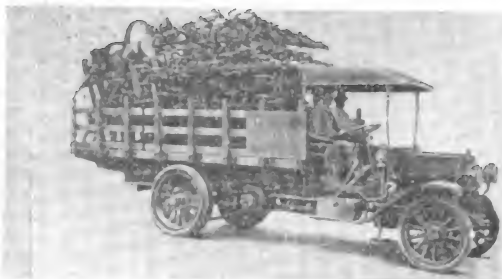


COOLING—Pump, cell.
IGNITION—Double.
CARBURETOR—Stromberg.
WHEELBASE—148 or 172 in.
TIRES—Front, 36x5; rear, 36x3½, dual.
SPRINGS—Half elliptic, 12 leaved.
AXLES—Front, I-beam.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

**VELIE
3-ton**

VELIE MOTOR VEHICLE CO.
Moline, Ill.

CAPACITY—3 tons.
PRICE—Chassis, \$3,350.
CYLINDERS—4-4½x5¼ in., pairs.
H. P.—32.4



COOLING—Pump, cell.
IGNITION—Double.
CARBURETOR—Stromberg.
WHEELBASE—148 or 172 in.
TIRES—Front, 36x5; rear, 40x5, dual.
SPRINGS—Half elliptic, 14 leaved.
AXLES—Front, I-beam; rear 4 in. rd.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

**VELIE
3-ton**

VELIE MOTOR VEHICLE CO.
Moline, Ill.

CAPACITY—3 tons.
PRICE—Chassis, \$3,350.
CYLINDERS—4-4½x5¼ in., pairs.
H. P.—32.4



COOLING—Pump, cell.
IGNITION—Double.
CARBURETOR—Stromberg.
WHEELBASE—148 or 172 in.
TIRES—Front, 36x5; rear, 40x5, dual.
SPRINGS—Half elliptic, 14 leaved.
AXLES—Front, I-beam; rear 4 in. rd.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

**JACKSON
1,200-lb.**

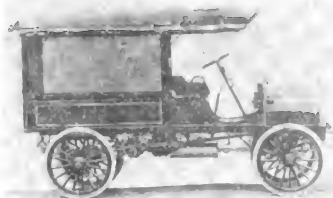
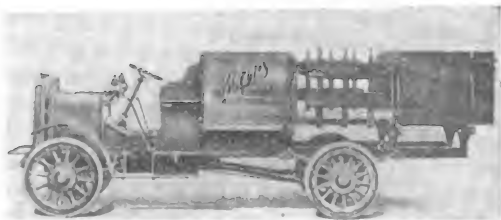
JACKSON AUTOMOBILE CO.
Jackson, Mich.

CAPACITY—\$1,200.
PRICE—\$1,200.
CYLINDERS—4-4¼x4¼ in., pairs.
H. P.—35.



COOLING—Thermo. Cell.
IGNITION—Dual, Splitdorf magneto.
CARBURETOR—Schebler.
WHEELBASE—115 in.
TIRES—33x4 in.
SPRINGS—Elliptic.
AXLE—Front, I-beam.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Two sets.
BEARINGS—Ball.

ALCO
2-tonAMERICAN LOCOMOTIVE CO.
1886 Broadway, New York CityCAPACITY—2 tons.
PRICE—\$2,950.
CYLINDERS—4-4½x5½.
H. P.—32.4.COOLING—Pump, tube.
IGNITION—Dual.
CARBURETOR—Newc.
WHEELBASE—112 in.
TIRES—Front, 36x4; rear 36x3, twin.
SPRINGS—Half elliptic.
AXLES—2 3-8x3 7-16 and 2¼x3¼.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Timken roller.**ALCO**
3½-tonAMERICAN LOCOMOTIVE CO.
1886 Broadway, New York CityCAPACITY—3½ tons.
PRICE—\$3,650.
CYLINDERS—4-5x6 in.
H. P.—36.COOLING—Pump, tube.
IGNITION—Dual.
CARBURETOR—Newc.
WHEELBASE—126 in.
TIRES—Front, 36x5; rear, 36x4, twin.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; rear, rect.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Timken roller.**ALCO**
5-tonAMERICAN LOCOMOTIVE CO.
1886 Broadway, New York CityCAPACITY—5 tons
PRICE—\$4,750.
CYLINDERS—4-5x6 in.
H. P.—40.COOLING—Pump, tube.
IGNITION—Dual.
CARBURETOR—Newc.
WHEELBASE—144 in.
TIRES—Front, 36x6; rear, 42x5, twin.
SPRINGS—Half elliptic.
AXLES—Rect.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Timken roller.**ALCO**
6½-tonAMERICAN LOCOMOTIVE CO.
1886 Broadway, New York CityCAPACITY—6½ tons.
PRICE—\$5,500.
CYLINDERS—4-5x6 in.
H. P.—40.COOLING—Pump, tube.
IGNITION—Dual.
CARBURETOR—Newc.
WHEELBASE—144 and 164 in.
TIRES—Front, 36x7; rear, 42x6, twin.
SPRINGS—Half elliptic.
AXLES—Rect.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Timken roller.**AVERY**
2-tonAVERY COMPANY
Peoria, Ill.CAPACITY—2 tons.
PRICE—\$2,500.
CYLINDERS—4-4¾x5, singly.
H. P.—45.COOLING—Pump.
IGNITION—Dual, Elsemann magneto.
CARBURETOR—Opt.
WHEELBASE—140 in.
TIRES—Front, 36x4; rear, 36x3½, dual.
SPRINGS—Half elliptic.
AXLES—Front, spec.; rear, 2¾ in.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.**AVERY**
3-tonAVERY COMPANY
Peoria, Ill.CAPACITY—3 tons.
PRICE—\$3,000.
CYLINDERS—4-4¾x5, singly.
H. P.—45.COOLING—Pump.
IGNITION—Dual, Elsemann magneto.
CARBURETOR—Opt.
WHEELBASE—140 in.
TIRES—Front, 38x5; rear, 38x4, dual.
SPRINGS—Half elliptic.
AXLES—Front, spec.; rear, 2¾ in.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

McINTYRE
1,500-lb.W. H. McINTYRE CO.
Auburn, Ind.CAPACITY—1,500 lbs.
PRICE—\$950.
CYLINDERS—2-5¼x4 in.
H. P.—20.COOLING—Thermo., tube.
IGNITION—Dual.
CARBURETOR—Schebler.
WHEELBASE—96 in.
TIRES—Front, 34x1¼; rear, 34x2, solid
SPRINGS—Full elliptic.
AXLES—1½ in. sq.
CLUTCH—Multiple disc.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Contracting, rear wheels.
BEARINGS—Roller.**McINTYRE**
1-tonW. H. McINTYRE CO.
Auburn, Ind.CAPACITY—1 ton.
PRICE—\$1,300.
CYLINDERS—2-5¼x4¼ in.
H. P.—24.COOLING—Thermo., tube.
IGNITION—Dual.
CARBURETOR—Schebler.
WHEELBASE—119 in.
TIRES—Front, 34x2½.
SPRINGS—Full elliptic, 2 in., 9 leaf.
AXLES—1¼ in. sq.
CLUTCH—Multiple disc.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Internal, foot and hand.
BEARINGS—Roller.**McINTYRE**
1½-tonW. H. McINTYRE CO.
Auburn, Ind.CAPACITY—1½ tons.
PRICE—\$1,600.
CYLINDERS—4-4½x4¼ in.
H. P.—35.COOLING—Pump.
IGNITION—Dual, Briggs magneto.
CARBURETOR—Schebler.
WHEELBASE—119 in.
TIRES—Front, 34x3; rear, 34x3½.
SPRINGS—Front, full elliptic; rear platform.
AXLES—1¼ in. sq.
CLUTCH—Multiple disc.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Internal, foot and hand.
BEARINGS—Roller.**McINTYRE**
2-tonW. H. McINTYRE CO.
Auburn, Ind.CAPACITY—2 tons.
PRICE—\$2,350.
CYLINDERS—4-4½x5¼ in.
H. P.—40.COOLING—Thermo., tube.
IGNITION—Magneto.
CARBURETOR—Schebler.
WHEELBASE—144 in.
TIRES—34x3½ in.
SPRINGS—Half elliptic.
AXLES—Square.
CLUTCH—Multiple disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Internal, foot and hand.
BEARINGS—Roller.**MAIS**
1½-tonMAIS MOTOR TRUCK CO.
Indianapolis, Ind.CAPACITY—1½ tons.
PRICE—\$2,750.
CYLINDERS—4-4x5¼, pairs.
H. P.—24.COOLING—Pump, tube.
IGNITION—Single, Elsemann magneto
CARBURETOR—Ravf.
WHEELBASE—116 or 128 in.
TIRES—Front, 36x3½; rear, 36x5 or 36x3 twin.
SPRINGS—Half elliptic.
AXLES—Front, tube; rear, 2½ round.
CLUTCH—Exp.
GEAR SET—Prog.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—External and internal.
BEARINGS—Timken roller.**MAIS**
2½-tonMAIS MOTOR TRUCK CO.
Indianapolis, Ind.CAPACITY—2½ tons.
PRICE—\$3,000.
CYLINDERS—4-4x5¼, pairs.
H. P.—24.COOLING—Pump, tube.
IGNITION—Single, Elsemann magneto
CARBURETOR—Ravf.
WHEELBASE—128 in.
TIRES—Front, 36x4; rear, 36x6 or 36x3½ twin.
SPRINGS—Half elliptic.
AXLES—Front, tube; rear, 2½ round.
CLUTCH—Exp.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—External and internal.
BEARINGS—Timken roller.

GRABOWSKY

1-ton

GRABOWSKY POWER WAGON CO.
Detroit, Mich.

CAPACITY—1 ton.
PRICE—Chassis, \$2,200.
CYLINDERS—4-4¼x4½, pairs.
H. P.—28.9.



COOLING—Pump, cell.
IGNITION—Dual, Bosch magneto.
CARBURETOR—Float feed.
WHEELBASE—121 in.
TIRES—Front, 34x3½; rear, 34x4.
SPRINGS—Half elliptic and platform.
AXLES—I-beam.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.

GRABOWSKY

2-ton

GRABOWSKY POWER WAGON CO.
Detroit, Mich.

CAPACITY—2 ton.
PRICE—Chassis, \$3,000.
CYLINDERS—4-4¼x4½, pairs.
H. P.—28.9.



COOLING—Pump, cell.
IGNITION—Dual, Bosch magneto.
CARBURETOR—Float feed.
WHEELBASE—145 in.
TIRES—Front, 36x4; rear, 36x3½, twin.
SPRINGS—Half elliptic and platform.
AXLES—I-beam.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.

GRABOWSKY

3-ton

GRABOWSKY POWER WAGON CO.
Detroit, Mich.

CAPACITY—3 tons.
PRICE—
CYLINDERS—4-5x5, pairs.
H. P.—40.



COOLING—Pump, cell.
IGNITION—Dual, Bosch magneto.
CARBURETOR—Float feed.
WHEELBASE—145 in.
TIRES—Front, 36x5; rear, 40x4, twin.
SPRINGS—Half elliptic and platform.
AXLES—I-beam.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEED—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.

GRABOWSKY

5-ton

GRABOWSKY POWER WAGON CO.
Detroit, Mich.

CAPACITY—5 tons.
PRICE—
CYLINDERS—4-5¼x5½, pairs.
H. P.—44.1.



COOLING—Pump, cell.
IGNITION—Dual, Bosch magneto.
CARBURETOR—Float feed.
WHEELBASE—156 in.
TIRES—Front, 38x6; rear, 42x6.
SPRINGS—Half elliptic and platform.
AXLES—I-beam.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.

GENEVA

GENEVA WAGON CO.
Geneva, N. Y.

CAPACITY—
PRICE—\$1,300.
CYLINDERS—2-5½x4½.
H. P.—20.



TYPE B

COOLING—Pump, tube.
IGNITION—Single, opt. magneto.
CARBURETOR—Schebler.
WHEELBASE—96 in.
TIRES—Front, 34x2; rear, 36x2½.
SPRINGS—Front, half elliptic; rear, full elliptic.
AXLES—Solid, 1½ in.
CLUTCH—Disc.
GEAR SET—Planetary.
DRIVE—Chain.
SPEEDS—2 forward and reverse.
BRAKES—Service, internal.
BEARINGS—Ball.

GENEVA

GENEVA WAGON CO.
Geneva, N. Y.

CAPACITY—
PRICE—\$1,300.
CYLINDERS—2-5½x4½.
H. P.—20.



COOLING—Pump, tube.
IGNITION—Single, opt. magneto.
CARBURETOR—Schebler.
WHEELBASE—96 in.
TIRES—Front, 34x2; rear, 36x2½.
SPRINGS—Front, half elliptic; rear, full elliptic.
AXLES—Front, solid, 1½ in.
CLUTCH—Disc.
GEAR SET—Planetary.
DRIVE—Chain.
SPEEDS—2 forward and reverse.
BRAKES—Service, internal.
BEARINGS—Ball.

FRANKLIN
DeliveryFRANKLIN AUTOMOBILE CO.
Syracuse, N. Y.CAPACITY—1,000 lbs.
PRICE—Chassis, \$2,350.
CYLINDERS—4-4x4, singly.
H. P.—25.6.COOLING—Air.
IGNITION—Magneto.
CARBURETOR—Own.
WHEELBASE—122 in.
TIRES—36x4½.
SPRINGS—Elliptic.
AXLES—Front, tube; rear, semi-float
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Two sets, external.
BEARINGS—Roller and ball.**FRANKLIN**
PlatformFRANKLIN AUTOMOBILE CO.
Syracuse, N. Y.CAPACITY—1 ton.
PRICE—\$2,400; express body \$2,500.
CYLINDERS—4-3 3-8x4 singly.
H. P.—18.3.COOLING—Air.
IGNITION—Magneto.
CARBURETOR—Own.
WHEELBASE—94 in.
TIRES—36x5½.
SPRINGS—Front, elliptic; rear, semi.
AXLES—Front, tube; rear, semi-float
CLUTCH—Multiple Disc.
GEAR SET—Prog. sliding.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Two sets.
BEARINGS—Roller and ball.**FRANKLIN**
ExpressFRANKLIN AUTOMOBILE CO.
Syracuse, N. Y.CAPACITY—1 ton.
PRICE—\$2,500; platform body, \$2,400.
CYLINDERS—4-3 3-8x4 singly.
H. P.—18.3.COOLING—Air.
IGNITION—Magneto.
CARBURETOR—Own.
WHEELBASE—94 in.
TIRES—36x5½.
SPRINGS—Front, elliptic; rear, semi.
AXLES—Front, tube; rear, semi-float
CLUTCH—Multiple Disc.
GEAR SET—Prog. sliding.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Two sets.
BEARINGS—Roller and ball.**ATTERBURY**
1-tonATTERBURY MOTOR CAR CO.
Buffalo, N. Y.CAPACITY—1 ton.
CYLINDERS—4-4x4½, en bloc.
H. P.—25.6.COOLING—Pump, tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—125 inches.
TIRES—Front, 36x3½; rear, 36x4.
SPRINGS—Half elliptic, 40 and 50 in.
AXLES—Front, I-beam; rear, 2¼ rd.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Internal.
BEARINGS—Roller.**ATTERBURY**
2-tonATTERBURY MOTOR CAR CO.
Buffalo, N. Y.CAPACITY—2 tons.
CYLINDERS—4-4¼x5½, en bloc.
H. P.—28.9.COOLING—Pump, tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—144 in.
TIRES—Front, 36x3½; rear, dual.
SPRINGS—Half elliptic, 40 and 50x2½.
AXLES—Front, I-beam; rear, 2¼ rd.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BEARINGS—Roller.**ATTERBURY**
3-tonATTERBURY MOTOR CAR CO.
Buffalo, N. Y.CAPACITY—3 tons.
CYLINDERS—4-4 7-8x5½, in pairs.
H. P.—38.COOLING—Pump, tube.
IGNITION—Double, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—154 in.
TIRES—Front, 36x4; rear, dual.
SPRINGS—Half elliptic, 40 and 54x3.
AXLES—Front, I-beam; rear 3¼ rd.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Internal.
BEARINGS—Roller.

SPEEDWELL Delivery

THE SPEEDWELL MOTOR CAR CO.
Dayton, Ohio.

CAPACITY—1,500 lbs.
PRICE—\$2,600.
CYLINDERS—4-4¼x4½, in pairs.
H. P.—35.

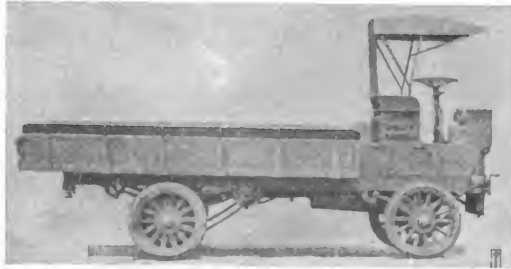


COOLING—Pump.
IGNITION—Magneto.
CARBURETOR—Schebler.
WHEELBASE—122 in.
TIRES—34x5 in.
AXLES—Front, I-beam; rear, bevel gear drive.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Two sets.
BEARINGS—Timken roller.

SPEEDWELL 4-ton

THE SPEEDWELL MOTOR CAR CO.
Dayton, Ohio.

CAPACITY—4 tons.
PRICE—\$3,500.
CYLINDERS—4-5x5 in., pairs.
H. P.—40.



COOLING—Pump, cell.
IGNITION—Single, Elsemann magneto.
CARBURETOR—Schebler.
WHEELBASE—115 and 139 in.
TIRES—36x5 and 36x5, twin.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; rear, 2¼ sq.
CLUTCH—Cone.
GEAR SET—Selective.
DRIVE—Chain.
BRAKES—Service internal; emergency trans.
BEARINGS—Timken roller.

SPEEDWELL 6-ton

THE SPEEDWELL MOTOR CAR CO.
Dayton, Ohio.

CAPACITY—6 tons.
PRICE—\$4,500.
CYLINDERS—4-5x5 in., pairs.
H. P.—40.



COOLING—Pump, cell.
IGNITION—Single, Elsemann magneto.
CARBURETOR—Schebler.
WHEELBASE—139 in.
TIRES—36x5½ and 36x5½, twin.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; rear, 3 in. sq.
CLUTCH—Cone.
GEAR SET—Selective.
DRIVE—Chain.
BRAKES—Service internal; emergency trans.
BEARINGS—Timken roller.

MONITOR 1-ton.

MONITOR AUTOMOBILE WORKS.
Janesville, Wis.

CAPACITY—1 ton.
PRICE—\$1,750.
CYLINDERS—2-5¼x4¾ in.
H. P.—24.



COOLING—Thermo-syphon.
IGNITION—Dual, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—100 in.
TIRES—Front, 33x2½; rear, 34x3.
SPRINGS—Front, half elliptic; rear, full elliptic.
AXLES—Front, I-beam, 3 in.; rear, live semi-floating.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Dual.
BEARINGS—Roller.

MONITOR 1-ton.

MONITOR AUTOMOBILE WORKS.
Janesville, Wis.

CAPACITY—1 ton.
PRICE—\$1,750.
CYLINDERS—2-5¼x4¾ in.
H. P.—24.



COOLING—Thermo-syphon.
IGNITION—Dual, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—100 in.
TIRES—Front, 33x2½; rear, 34x3.
SPRINGS—Front, half elliptic; rear, full elliptic.
AXLES—Front, I-beam, 3 in.; rear, live semi-floating.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Dual.
BEARINGS—Roller.

MONITOR 1,500-lb.

MONITOR AUTOMOBILE WORKS.
Janesville, Wis.

CAPACITY—1,500 lbs.
PRICE—\$1,000.
CYLINDERS—2-5x4 in.
H. P.—20.



COOLING—Thermo., tube.
IGNITION—Dual, Remy magneto.
CARBURETOR—Schebler.
WHEELBASE—100 in.
TIRES—Front, 33x2½; rear, 34x3.
SPRINGS—Front, half elliptic; rear, full elliptic.
AXLES—Front, I-beam, 3 in.; rear, live semi-floating.
CLUTCH—Cone.
GEAR SET—Planetary.
DRIVE—Shaft.
SPEEDS—2 forward and reverse.
BRAKES—Dual.
BEARINGS—Roller.

KELLY
(Frayer-Miller)
1-ton

KELLY MOTOR VEHICLE CO.
Springfield, Ill.

CAPACITY—1 ton.
PRICE—Chassis, \$2,100.



CYLINDERS—4-4 3-8x5½, singly.
H. P.—30.
COOLING—Blower.
IGNITION—Magneto.
WHEELBASE—120 in.
TIRES—36x3½ and 36x4.
SPRINGS—Half elliptic.
AXLES—1-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

KELLY
(Frayer-Miller)
2-ton

KELLY MOTOR VEHICLE CO.
Springfield, Ill.

CAPACITY—2 tons.
PRICE—Chassis, \$2,800.

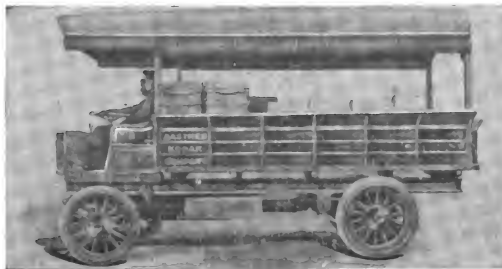


CYLINDERS—4-4 3-8x5½, singly.
H. P.—30.
COOLING—Blower.
IGNITION—Magneto.
CARBURETOR—Breeze.
WHEELBASE—136 in.
TIRES—36x4 and 36x5.
SPRINGS—Half elliptic.
AXLES—1-beam.
CLUTCH—Disc.
GEAR SET—Selective.
SPEEDS—4 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

KELLY
(Frayer-Miller)
3-ton

KELLY MOTOR VEHICLE CO.
Springfield, Ill.

CAPACITY—3 tons
PRICE—Chassis, \$3,300.

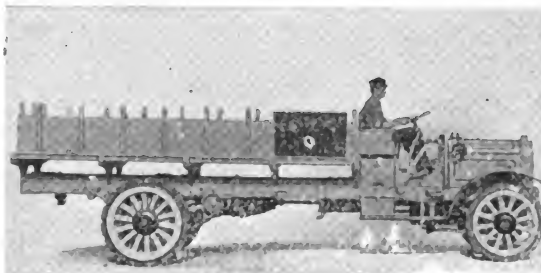


CYLINDERS—4-4 3-8x5½, singly.
H. P.—30.
COOLING—Blower.
IGNITION—Magneto.
CARBURETOR—Breeze.
WHEELBASE—136 in.
TIRES—36x4 and 38x4, dual.
SPRINGS—Half elliptic and platform.
AXLES—1-beam.
CLUTCH—Disc.
GEAR SET—Selective.
SPEEDS—4 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

PEERLESS
3-ton

THE PEERLESS MOTOR CAR CO.
Cleveland, Ohio

CAPACITY—3 tons.
PRICE—Chassis, \$3,700.
CYLINDERS—4-4½x6½, pairs.
H. P.—32.4.

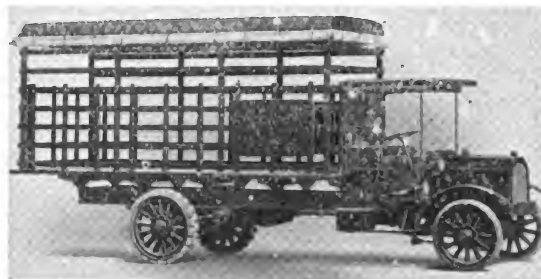


COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Own.
WHEELBASE—151 and 174 in.
TIRES—36x4 and 40x4, twin.
SPRINGS—Half elliptic.
AXLES—Front, 2x3¼; rear, 2½x3¼.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—4 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

PEERLESS
4-ton

THE PEERLESS MOTOR CAR CO.
Cleveland, Ohio

CAPACITY—4 tons.
PRICE—Chassis, \$4,000.
CYLINDERS—4-4½x6½, pairs.
H. P.—32.4.



COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Own.
WHEELBASE—151 and 174 in.
TIRES—36x5 and 40x5, twin.
SPRINGS—Half elliptic.
AXLES—Front, 2x3¼; rear, 2½x3¼.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—4 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

PEERLESS
5-ton

THE PEERLESS MOTOR CAR CO.
Cleveland, Ohio

CAPACITY—5 tons.
PRICE—Chassis, \$4,000.
CYLINDERS—4-4½x6½, pairs.
H. P.—32.4.



COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Own.
WHEELBASE—151 and 174 in.
TIRES—38x6 and 42x6, twin.
AXLES—Front, 2x3¼; rear, 2½x4¼.
CLUTCH—Cone.
GEAR SET—Selective.
SPEED—4 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

KEARNS 600-lb.

KEARNS MOTOR CAR CO.
Beavertown, Pa.

CAPACITY—600 lbs.
CYLINDERS—3-4x4, two-cycle.
H. P.—20.



COOLING—Air.
IGNITION—Unisparker.
CARBURETOR—Schebler.
WHEELBASE—100 in.
TIRES—1½x1½.
SPRINGS—4, full elliptic.
AXLES—1 3-8 in.
TRANSMISSION—Friction.
DRIVE—Chain.
BRAKES—Internal.
BEARINGS—Ball.

KEARNS 1,500-lb.

KEARNS MOTOR CAR CO.
Beavertown, Pa.

CAPACITY—1,500 lbs.
PRICE—\$1,075.
CYLINDERS—3-4x4, two-cycle.



COOLING—Air.
IGNITION—Single.
CARBURETOR—Schebler.
WHEELBASE—100 in.
TIRES—Front, 34x2; rear, 34x2.
SPRINGS—Elliptic.
AXLES—Front sq.
GEAR SET—Friction.
DRIVE—Chain.
BRAKES—Service internal, external.
BEARINGS—Ball.

SULLIVAN 1,000-lb.

SULLIVAN MOTOR CAR CO.
Rochester, N. Y.

CAPACITY—1,000 lbs.
PRICE—\$1,050.
CYLINDERS—2-4½x4½.
H. P.—18.

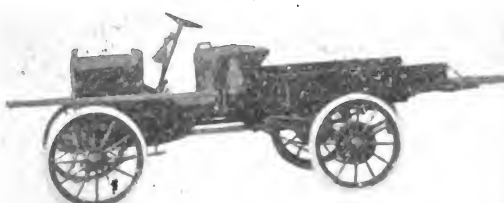


COOLING—Thermo., tube.
IGNITION—Single, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—92 in.
TIRES—36x2½ in.
SPRINGS—Full elliptic.
AXLES—Front sq.
CLUTCH—Cone.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Service internal.
BEARINGS—Ball.

SULLIVAN 1,500-lb.

SULLIVAN MOTOR CAR CO.
Rochester, N. Y.

CAPACITY—1,500 lbs.
PRICE—\$1,000.
CYLINDERS—2-4½x4½.
H. P.—16.2.

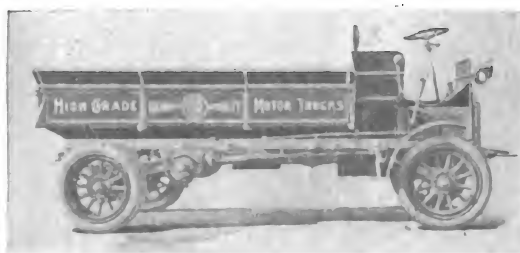


COOLING—Thermo., tube.
IGNITION—Single, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—110 in.
TIRES—36x2½ in.
SPRINGS—Full elliptic.
AXLES—Front sq.
CLUTCH—Cone.
GEAR SET—Planetary.
SPEEDS—2 forward and reverse.
DRIVE—Chain.
BRAKES—Service internal.
BEARINGS—Ball.

DECATUR 1½-ton

DECATUR MOTOR CAR CO.
Decatur, Ind.

CAPACITY—1½ tons.
PRICE—Chassis, \$2,200, \$2,500, body extra.
CYLINDERS—4x4 in.
H. P.—30.



IGNITION—Simms magneto.
CARBURETOR—Rayfield.
WHEELBASE—129 in.
TIRES—Front, 34x3½; rear, 34x4 solid or 34x4½ pneumatic.
SPRINGS—Half elliptic front, 6 plate 2½x10; platform rear, 6 and 8 plate
AXLES—Front 2½x1¼ in; rear, 2 in.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Internal and expanding.
BEARINGS—Ball.

DECATUR 1½-ton

DECATUR MOTOR CAR CO.
Decatur, Ind.

CAPACITY—1½ tons.
PRICE—Chassis, \$2,200-\$2,500; body extra.
CYLINDERS—4x4 in.
H. P.—30.



IGNITION—Simms magneto.
CARBURETOR—Rayfield.
WHEELBASE—129 in.
TIRES—Front, 34x3½; rear, 34x4 solid or 34x4½ pneumatic.
SPRINGS—Front, half elliptic, 6 plate 2½x10; rear, platform, 6 and 8 plate
AXLES—Front, 2½x1¼; rear, 2 in.
CLUTCH—Multiple disc.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—Internal and expanding.
BEARINGS—Ball.

FEDERAL

1-ton

FEDERAL MOTOR TRUCK CO.
Detroit, Mich.

CAPACITY—1 ton.
PRICE—Chassis, \$1,800.
CYLINDERS—4-4½x4½ in.
H. P.—30.



COOLING—Pump.
IGNITION—Single, Elsemann magneto.
CARBURETOR—Stromberg.
WHEELBASE—144 in.
TIRES—Front, 36x3½; rear, 36x4.
SPRINGS—Half elliptic.
AXLE—Front, I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Internal.
BEARINGS—Roller.

SCHACHT

3-ton

THE SCHACHT MOTOR CAR CO.
Cincinnati, O.

CAPACITY—3 tons.
PRICE—\$3,000.
CYLINDERS—4-4½x5, enbloc.



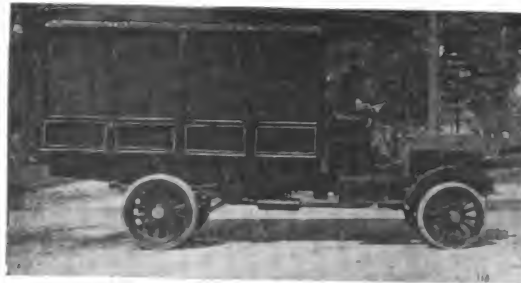
COOLING—Pump.
IGNITION—Mea or Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—144 in.
TIRES—36x4 in., dual rear.
SPRINGS—Half elliptic.
CLUTCH—Cone.
GEAR SET—Sliding.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Internal.

STEARNS

5-ton

THE F. B. STEARNS CO.
Cleveland, Ohio.

CAPACITY—5 tons.
CYLINDERS—4-4½x6 in.
H. P.—36.1.



IGNITION—Dual, Bosch magneto.
CARBURETOR—Own.
WHEELBASE—144 and 180 in.
TIRES—Front, 34x5; rear 38x4½, dual.
SPRINGS—Front, 42x3x2¼, 9 leaves;
rear, 54x3½x5½, 16 leaves.
AXLES—Solid, one piece.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEED—4 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.

BABCOCK

1,000—1,500-ton

H. H. BABCOCK COMPANY
Watertown, N. Y.

CAPACITY—1,000 to 1,500 lbs.
PRICE—\$1,650.
CYLINDERS—2-5¼x4, opposed.
H. P.—20.



COOLING—Thermo-syphon, tube.
IGNITION—Dual, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—100 in.
TIRES—34x3 in.
SPRINGS—Half platform, rear; half elliptic, front.
AXLES—Front, spec.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Internal.
BEARINGS—Ball.

ATLAS
Delivery

ATLAS MOTOR CAR CO.
Springfield, Mass.

CAPACITY—Delivery.
PRICE—\$1,750.
CYLINDERS—2-4½x4½, 2 cycle.
H. P.—20.



COOLING—Pump, Cell.
IGNITION—Single.
CARBURETOR—Own.
WHEELBASE—106 in.
TIRES—32x4½ in.
SPRINGS—Half elliptic.
AXLES—Front, I-beam; full float rear.
CLUTCH—Multiple Disc.
GEAR SET—Selective.
SPEEDS—3, selective.
DRIVE—Shaft.
BRAKES—Trans. service.
BEARINGS—Timken roller.

INTERNATIONAL
1,000-lb.

INTERNATIONAL HARVESTER CO. OF AMERICA
Chicago, Ill.

CAPACITY—1,000 lbs.
PRICE—
CYLINDERS—2-5x5.
H. P.—20.



COOLING—Air.
IGNITION—Dual, Bosch magneto.
CARBURETOR—Schebler.
WHEELBASE—90 in.
TIRES—1¼ in. side wire.
SPRINGS—Elliptic, 36x13-8 in.
AXLES—Front sq.
CLUTCH—Band.
GEAR SET—Clutch.
SPEED—2 forward and reverse, one lever.
DRIVE—Chain.
BRAKES—External and internal.
BEARINGS—Roller.
STEER—Wheel.

HYDRAULIC 5-ton

HYDRAULIC TRUCK SALES CO.
New York City

CAPACITY—5 ton.
CYLINDERS—4-5½x6, in pairs.
H. P.—48.

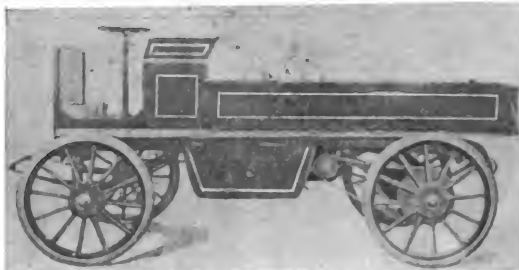


COOLING—Pump.
IGNITION—Dual.
CARBURETOR—Schebler.
WHEELBASE—143 in.
TIRES—36x5; 38x9, Kelly-Springfield block.
SPRINGS—Half elliptic.
AXLES—Front, I-beam 4x2½; rear, 3 in. square.
CLUTCH—None.
GEAR SET—Hydraulic transmission and speed control.
DRIVE—Chain.
BRAKES—Emergency only.
BEARINGS—Timken roller.

SCHMIDT 1,000-1,500-lb.

SCHMIDT BROS. CO.
Chicago, Ill.

CAPACITY—1,000-1,500 lbs.
PRICE—Chassis, \$1,025.
CYLINDERS—Two.
H. P.—18.



COOLING—Air.
IGNITION—Magneto.
CARBURETOR—Schebler.
WHEELBASE—90 in.
TIRES—Front, 36x2; rear, 38x2.
SPRINGS—Front, 2 in. ¼-elliptic; rear 2 in. coil.
AXLES—Front opt.
CLUTCH—Multiple disc.
SPEEDS—2 forward and reverse; planetary.
DRIVE—Chain.
BRAKES—Internal.
BEARINGS—Ball.

SCHMIDT 1-ton

SCHMIDT BROS. CO.
Chicago, Ill.

CAPACITY—1 ton.
PRICE—\$1,375.
CYLINDERS—Two.
H. P.—20.



COOLING—Air.
IGNITION—Magneto.
CARBURETOR—Schebler.
WHEELBASE—92 in.
TIRES—Front, 36x2½; rear, 38x2½.
SPRINGS—Front, ¼-elliptic; rear coil.
AXLES—Front opt.
CLUTCH—Multiple disc.
SPEEDS—2 forward and reverse; planetary.
DRIVE—Chain.
BRAKES—Internal.
BEARINGS—Ball.

BEST 800-lb.

DURANT-DORT CARRIAGE CO.
Flint, Mich.

CAPACITY—800 lbs.
PRICE—\$900.
CYLINDERS—2-4¼x4¼, opposed.
H. P.—12.



COOLING—Thermo-syphon.
CARBURETOR—Kingston.
IGNITION—Dual.
WHEELBASE—76 in.
TIRES—Solid.
SPRINGS—Front, half elliptic; rear full elliptic.
AXLES—Front, 13-8x1½; rear axle dead.
GEAR SET—Friction.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

BOWLING GREEN 1,500-lb.

BOWLING GREEN MOTOR CAR CO.
Bowling Green, Ohio

CAPACITY—1,500 lbs.
PRICE—Chassis, \$1,600.
CYLINDERS—4-4¾x5¼, en bloc, Continental
H. P. 30.



COOLING—Pump.
IGNITION—Dual.
WHEELBASE—114 in.
TIRES—36x3 and 36x3½, also pneumatic special.
SPRINGS—Half elliptic.
AXLES—I-section, 2½x17-8.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.

CUNNINGHAM Funeral Car

JAMES CUNNINGHAM, SON & CO.
Rochester, N. Y.

CAPACITY—Funeral car.
CYLINDERS—4-4¾x5¼, in pairs.
H. P.—40.



COOLING—Pump.
IGNITION—Dual, Bosch magneto.
WHEELBASE—134 in.
TIRES—36x5 in.
AXLES—Front, I-beam; rear, Timken full floating.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—External and internal.
BEARINGS—Timken roller.

GENERAL VEHICLE
750-lb.GENERAL VEHICLE CO.
Long Island City, N. Y.

MOTOR—Single.
BATTERY—Own.
MILEAGE CAPACITY—45 miles, 12 miles per hour.
TIRES—Solid.
LOAD CAPACITY—750 lbs.
WHEELBASE—74 in.
GAUGE—52 in.
STEERING—Wheel.
DRIVE—Chain.

GENERAL VEHICLE
1,000-lb.GENERAL VEHICLE CO.
Long Island City, N. Y.

MOTOR—Single.
BATTERY—Own.
MILEAGE CAPACITY—45 miles, 12 miles per hour.
TIRES—Solid.
LOAD CAPACITY—1,000 lbs.
WHEELBASE—84¾ in.
GAUGE—56 in.
STEERING—Wheel.
DRIVE—Chain.

GENERAL VEHICLE
1-tonGENERAL VEHICLE CO.
Long Island City, N. Y.

MOTOR—Single.
BATTERY—Own.
MILEAGE CAPACITY—45 miles, 10 miles per hour.
TIRES—Solid.
LOAD CAPACITY—1 ton.
WHEELBASE—102 in.
GAUGE—60 in.
STEERING—Wheel.
DRIVE—Chain.

GENERAL VEHICLE
2-tonGENERAL VEHICLE CO.
Long Island City, N. Y.

MOTOR—Single.
BATTERY—Own.
MILEAGE CAPACITY—45 miles, 9 miles per hour.
TIRES—Solid.
LOAD CAPACITY—2 tons.
WHEELBASE—112½ in.
GAUGE—61 in.
STEERING—Wheel.
DRIVE—Chain.

GENERAL VEHICLE
3½-tonGENERAL VEHICLE CO.
Long Island City, N. Y.

MOTOR—Single.
BATTERY—Own.
MILEAGE CAPACITY—40 miles, 8 miles per hour.
TIRES—Solid.
LOAD CAPACITY—3½ tons.
WHEELBASE—126 in.
GAUGE—65 in.
STEERING—Wheel.
DRIVE—Chain.

GENERAL VEHICLE
5-tonGENERAL VEHICLE CO.
Long Island City, N. Y.

MOTOR—Single.
BATTERY—Own.
MILEAGE CAPACITY—35 miles, 7 miles per hour.
TIRES—Solid.
STEERING—Wheel.
DRIVE—Chain.

COMMERCIAL TRUCK 500-lb

COMMERCIAL TRUCK CO. OF
AMERICA
Philadelphia, Pa.

PRICE—Chassis, \$1,800; com. \$2,000.
MOTOR—1-85 volt; 16 amp.
CONTROLLER—Continuous torque.
CONTROL HANDLE LOCATION—
Left.



BATTERY—42 cells lead; 60 cells Edison.
MILEAGE CAPACITY—15 M. P. H.
TIRES—2½x36.
BODY—Delivery.
LOAD CAPACITY—500 lbs.
WHEELBASE—85 in.
GAUGE—56½ or 62 in.
WEIGHT—3,000 lbs.
SPRINGS—Half elliptic.
BRAKES—Two sets.
STEERING—Wheel.
SPEEDS—3 forward and 2 reverse.
DRIVE—Shaft, worm and gear.

COMMERCIAL TRUCK 1,000-lb.

COMMERCIAL TRUCK CO. OF
AMERICA
Philadelphia, Pa.

PRICE—\$2,200.
MOTOR—1-85 volt; 22 amp.
CONTROLLER—Continuous torque.
CONTROL HANDLE LOCATION—
Left.



BATTERY—42 cells lead; 62 cells Edison.
MILEAGE CAPACITY—15 M. P. H.
TIRES—2½x36 and 3x36.
BODY—Delivery.
LOAD CAPACITY—1,000 lbs.
WHEELBASE—90 or 100 in.
GAUGE—56½ or 62 in.
WEIGHT—3,500 lbs.
SPRINGS—Front, 34; rear, half elliptic.
BRAKES—Two sets.
STEERING—Wheel.
SPEEDS—3 forward and 2 reverse.
DRIVE—Shaft, worm and gear.

COMMERCIAL TRUCK 1-ton

COMMERCIAL TRUCK CO. OF
AMERICA
Philadelphia, Pa.

PRICE—\$2,800.
MOTOR—2-85 volt; 16 amp.
CONTROLLER—Continuous torque.
CONTROL HANDLE LOCATION—
Left.



BATTERY—42 cells lead; 60 cells Edison.
MILEAGE CAPACITY—12 M. P. H.
TIRES—3½x36 and 4x36.
BODY—Express.
LOAD CAPACITY—2,000 lbs.
WHEELBASE—100 in.
GAUGE—56½ or 62 in.
WEIGHT—4,500 lbs.
SPRINGS—Half elliptic.
BRAKES—Two sets.
STEERING—Wheel.
SPEEDS—4 forward and 2 reverse.
DRIVE—Shaft, planetary and spur gear.

COMMERCIAL TRUCK 2-ton

COMMERCIAL TRUCK CO. OF
AMERICA
Philadelphia, Pa.

PRICE—\$3,500.
MOTOR—2-85 volt; 22 ampere.
CONTROLLER—Continuous torque.
CONTROL HANDLE LOCATION—
Left.



BATTERY—42 cells lead; 60 cells Edison.
MILEAGE CAPACITY—10 M. P. H.
TIRES—5x36 and 3½x36, dual.
BODY—Stake platform.
LOAD CAPACITY—4,000 lbs.
WHEELBASE—116 in.
GAUGE—66 in.
WEIGHT—6,500 lbs.
SPRINGS—Half elliptic.
BRAKES—Two sets.
STEERING—Wheel.
SPEEDS—4 forward and 2 reverse.
DRIVE—Shaft, planetary and spur gear.

COMMERCIAL TRUCK 12-passenger

COMMERCIAL TRUCK CO. OF
AMERICA
Philadelphia, Pa.

PRICE—\$3,750.
MOTOR—2-85 volt; 16 amp.
CONTROLLER—Continuous torque.
CONTROL HANDLE LOCATION—
Left.



BATTERY—42 cells lead; 60 cells Edison.
MILEAGE CAPACITY—12 M. P. H.
TIRES—3½x36 and 4x36.
BODY—Bus.
LOAD CAPACITY—2,000 lbs.
WHEELBASE—100 in.
GAUGE—56½ or 62 in.
SPRINGS—Half elliptic.
BRAKES—Two sets.
STEERING—Wheel.
SPEEDS—4 forward and 2 reverse.
DRIVE—Shaft, planetary and spur gear.

COMMERCIAL TRUCK 3½-ton

COMMERCIAL TRUCK CO. OF
AMERICA
Philadelphia, Pa.

PRICE—\$4,500.
MOTOR—4-85 volt; 16 ampere.
CONTROLLER—Continuous torque.
CONTROL HANDLE LOCATION—
Left.



BATTERY—42 cells lead; 60 cells Edison.
MILEAGE CAPACITY—9 M. P. H.
TIRES—3½x36, dual front and rear.
BODY—Heavy express.
LOAD CAPACITY—7,000 lbs.
WHEELBASE—115 in.
GAUGE—66 in.
WEIGHT—8,500 lbs.
SPRINGS—Half elliptic.
BRAKES—Two sets.
STEERING—Wheel.
SPEEDS—4 forward and 2 reverse.
DRIVE—Chain and spur gear.

COMMERCIAL TRUCK 5-ton

COMMERCIAL TRUCK CO. OF
AMERICA

PRICE—Chassis, \$4,650; com., \$5,000.
MOTOR—4-85 volt, 16 ampere.
CONTROLLER—Continuous torque.
CONTROL HANDLE LOCATION—Left.



BATTERY—42 cells lead; 60 cells Edison.
MILEAGE CAPACITY—7 M. P. H.
TIRES—4x36, dual front and rear.
BODY—Heavy express.
LOAD CAPACITY—10,000 lbs.
WHEELBASE—132 in.
GAUGE—66 in.
WEIGHT—10,000 lbs.
SPRINGS—Half elliptic.
BRAKES—Two sets.
STEERING—Wheel.
SPEEDS—4 forward and 2 reverse.
DRIVE—Chain, spur gear.

WAVERLY 600-1,000-lb.

THE WAVERLY COMPANY
Indianapolis, Ind.

PRICE—\$1,800.
MOTOR—60 volt, 35 amperes.
MOTOR SUSPENSION—Body.
CONTROLLER—Knife blade type.
CONTROL HANDLE LOCATION—Left.



BATTERY—28 cells, 13 plate M.V. exide hycap.
BATTERY LOCATION—Below body.
MILEAGE CAPACITY—50-60 miles.
TIRES—32x2½.
BODY—Delivery.
LOAD CAPACITY—600-1,000 lbs.
WHEELBASE—87 in.
GAUGE—64 in.
SPRINGS—Full elliptic.
BRAKES—Emergency and internal.
STEERING—Wheel.
SPEED—5-16 miles per hour.
DRIVE—Shaft.

WAVERLY 3-ton

THE WAVERLY COMPANY
Indianapolis, Ind.

PRICE—\$3,750.
MOTOR—Double, 80 v., 2 series wound
MOTOR SUSPENSION—Frame, slides
CONTROLLER—Continuous torque, knife blade type.



BATTERY—42 cells 21 M.V. Hycap.
MILEAGE CAPACITY—8 miles per hour—40 miles.
TIRES—36x5; 36x3½, dual.
LOAD CAPACITY—3 tons.
WHEELBASE—118 in.
GAUGE—73 in.
SPRINGS—Half elliptic front; platform rear.
BRAKES—Two sets.
DRIVE—Chain.
BEARINGS—Timken roller.
STEERING—Wheel, pinion sector.

DETROIT 1,000-lb.

ANDERSON ELECTRIC CAR CO.
Detroit, Mich.

PRICE—\$2,700.
MOTOR—Single series wound.
MOTOR SUSPENSION—Cross bars.
CONTROLLER—Continuous torque, drum type.
CONTROL HANDLE—On top steering wheel.



BATTERY—60 cells, Edison A4.
BATTERY LOCATION—Underslung.
MILEAGE CAPACITY—55 miles.
TIRES—32x2½; 34x3.
BODY—Panel.
LOAD CAPACITY—1,000 lbs.
WHEELBASE—80 in.
GAUGE—68 in.
WEIGHT—2,900 lbs.
SPRINGS—Half elliptic.
BRAKES—Two sets, wheels and countershaft.
STEERING—Wheel, worm and sector
SPEEDS—5 forward and reverse.
DRIVE—Chain.

DETROIT 1-ton

ANDERSON ELECTRIC CAR CO.
Detroit, Mich.

PRICE—\$3,200.
MOTOR—Single series wound.
MOTOR SUSPENSION—Cross bars.
CONTROLLER—Continuous torque, drum type.



CONTROL HANDLE—On top steering wheel.
BATTERY—60 cells Edison A6.
BATTERY LOCATION—Underslung.
MILEAGE CAPACITY—55 miles.
TIRES—32x3; 34x3½.
BODY—Open express, driver's top.
LOAD CAPACITY—2,000 lbs.
WHEELBASE—84 in.
GAUGE—68 in.
WEIGHT—3,500 lbs.
SPRINGS—Half elliptic.
BRAKES—Two sets.
STEERING—Wheel, worm and sector
SPEEDS—5 forward and reverse.
DRIVE—Chain.

DETROIT 1½-ton

ANDERSON ELECTRIC CAR CO.
Detroit, Mich.

PRICE—\$3,475.
MOTOR—Single series wound.
MOTOR SUSPENSION—Cross bars.
CONTROLLER—Continuous torque, drum type.



CONTROL HANDLE—On top steering wheel.
BATTERY—60 cells Edison A6.
BATTERY LOCATION—Underslung.
MILEAGE CAPACITY—40 miles.
TIRES—34x3½; 36x4.
BODY—Express, canvas top.
LOAD CAPACITY—3,000 lbs.
WHEELBASE—96 in.
GAUGE—62 in.
WEIGHT—4,500 lbs..
SPRINGS—Half elliptic.
BRAKES—Two sets.
STEERING—Wheel, worm and sector
SPEEDS—5 forward and reverse.
DRIVE—Chain.

The Hub

THE TRADE NEWS PUBLISHING CO. OF N. Y.
Publishers of THE HUB

J. H. WRIGHT, President. G. A. TANNER, Secretary and Treasurer.
24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00
AMERICAN HARNESS AND SADDLERY
DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.
GERMANY.—Gustave Mieser, Bohn & Rn. Subscription price, 12 marks, postpaid.
ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Automobiles as a Subject.

Nothing could have been more agreeable to writers than the introduction of the motor-driven car. There is so much about the car, as well as the subject, that can be praised, abused, laughed at, and talked about.

It affords the engineer such an opportunity to display his crass ignorance, and it gives practical men who do know, such a chance to guffaw at the self-sufficient journalists who pretend to know more than they do know. This remark about the trade press writers is all-inclusive. This snorting monster, this imitation of a gatling gun in action mounted on a farm wagon body, was very new to the gentlemen of the press, and they sniffed at the subject after the manner of a frightened animal approaching the object of suspicion.

It demanded time and close attention to arrive at a fair working knowledge of what the machine-vehicle would do. The lesson is far from learned yet.

But what progress the tinkers have made.

One of the most interesting of speculations is the ultimate development of this power-wagon. The present model is without doubt a mere passing phase. Already we know enough of the possibilities to set down the present construction as crude, complicated and confusing, yet note the advance that has been made.

Simplification spells the note of progress, and it is found to a much greater extent in the stationary and marine engines of the internal combustion type, than where it ought to be found, that is, in the space-devouring mechanism.

The road will lead us far as may be surmised when we

learn that one maker has dispensed with upwards of a thousand superfluous parts, yet has a more efficient engine.

Even in an industry as young as this one conservatism has become a blighting influence. The maker who is organized to do the work in a certain way, hates to welcome improvement that disarranges matured plans and digs holes in the surplus, hence he scoffs at new ideas and hugs "standardization" to his pocket as if it were the last word.

It is the same with the top hamper of the vehicle. Once a design of body is devised that seems to be agreeable, then standardization gets in its work, and the builder fights as shy of diversity of line as the cheap buggy builder who dreams of quantity without change of design as the sure short cut to competency. This is good as a commercial proposition, but it is death to art and progress.

At the present time there is not a so-called touring body constructed that is not a replica of every other touring body. This is the way a pin factory turns out its product—useful but not distinguished.

There is one carriage builder in New York, there is one body builder in Belgium that produce individuality in work, the others are Chinese as we are accustomed to apply the term.

In one sense this is hypercritical criticism, because originality being the rarest of gifts, it costs a deal of money to make it function, and the greatest number would be deprived of the use and enjoyment of the engine-driven vehicle. The farmer never would have owned a buggy if it had to be a "Brewster" in place of a "Hercules," to cite an instance. Even the Brewster output in its halcyon days was coarse and without refinement compared with a William Rogers, yet Rogers never "got there" as a paying proposition. So after all, perhaps this talk of excellence of design is merely academic and "doesn't pay," which phrase is our national first commandment, and the other nine are like unto it. By it we judge and are judged.

It is, however, curious as well as interesting to study the development towards simplicity, and to acclaim its gradual success. We merely find fault with the false note of the maker who is not sincere enough to confess he is far from his goal, but is manfully trying for it, to such extent as it doesn't interfere with his bank balance. When improvement and progress forces him a step in advance against his "conservatism," we would like him better if he had the honesty to acknowledge the force in place of prating about the improvements he had "designed," when it was circumstance at his back all the time compelling him to do what he never would have done on his own initiative for the love of progress.

Hardwood—Hardwork.

We have referred to the fine fight being put up by Hardwood Record in behalf of the hardwood lumber trust, now that it is suffering an unusual experience of the trustee in the loss of trade that makes even a trust something ad supra, as our Latin friends might say.

The Record is a doughty champion. It has become

thrice armed, because it has gone out and sought truth, and all that it says about metal automobile bodies, for instance, agrees with what we know about the disadvantages of the material as compared with wood.

But alas! Why did its greedy patrons think of this as a condition that would debar the body builder from using anything but panel stock.

The ruthless way the barons jacked up the price of poplar, the tales of growing scarcity of stock, no doubt vamped up to sustain a quotation, and the customary trust method of sitting tight and assuming a take-it-or-leave-it attitude, is in amusing contrast with the present frantic gesticulations, that remind one of a naked boy on the river's brink whose clothes have been stolen.

Listen to what our neighbor says about the "tin" body:

The metal bodies that are being "put over" onto buyers today are practically just as fraudulent in character as is the full steel car equipment. There is no good reason why buyers of automobiles should not have wooden bodies on their vehicles—all they have to do is to refuse to buy a "tin" body, and automobile producers will be mighty quick to accede to the demand for a wooden body, but for some special type of vehicle they may be obliged to wait six weeks for delivery.

Listen to the mocking bird once more:

Automobile makers will tell you all about their engine, wheel base, steering gear, improved transmission, speed, "classy lines," and all this sort of thing, but they keep mighty still about the kind of bodies they are putting on their automobiles.

It is rather distressing to be in the position of one who must approve a sentiment, but have to frown upon the propounder of it because of his previous known bad methods.

The body builder has a sentimental preference for wood. It is without doubt better in every way when durability has to be considered. The body builder, however, builds bodies for a living, and he is going to supply what the demand asks for.

The demand would have continued for bodies built of wood, because they would have been offered with the arguments born of experience, but when rapacity blocks the road, we must politely bow to rapacity, and exclaim that after all the other road looks good to us, and we believe we will pursue our journey in that direction. The metal body has come to stay.

Ten Per Cent Poorer.

It seems the vehicle industry (horse-drawn) was 2,355,065 in 1904, but the output decreased to 2,106,293 in 1909, or ten per cent.

The automobiles show up in startling figures in one way, but not in another. The increase in that quarter was from 22,830 to 127,289 covering the same period, or an increase of 458 per cent.

As it was a new game, starting on the ground floor, it naturally had to show a startling percentage of increase without amounting to much as to real volume of business.

That 127 thousand just about displaced the heavy jobs of the horse-drawn kind, and as these are coming back again by slow degrees, it would seem as if the auto men would have really to look for new fields if there is to be a

steady increase of output. The inroads into horse-drawn territory are not what they should have been by a kind of vehicle that was to do up the horse and his kind completely.

It is characteristic of those joining a new cult that they look for the extinguishment of something established, be it religion or peanuts, rather than taking the gamier end of the proposition and trying to make still another and newer field that was not previously rolled over. It was the same with the bicycle; in fact, it has ever been so.

What the people need is more, and yet more transportation facilities, and the more kinds the better. Think of all the time and the trade when the lowly bookkeeper, and the gay but impecunious young clerk can tool himself to the store, shop, or elsewhere in his low-priced gas-runabout. That class only dreams dreams at present. The vehicle user has merely increased with the percentage ratio of population. He has not felt the impetus of a real increase.

In place of telling what they are going to do to the horse which the figures belie, why not get busy in making a really new class of users for gas buggies.

Painting Metal.

The aluminum, as also the black sheet steel (so-called) body is a joy, and a well-spring of profit to the painter.

The aluminum offers a nice surface on which to build up a finish, and very attractive work is the result.

It is only a short time before the body is dented, looking like a billy-cock hat in a riot, and then the body has to be done over, in part or as a whole. The very first day out of the shop another dent may be acquired, and the recent finish will have no opportunity to wear itself out before it is renewed.

This aluminum as a material suitable for bodies was the very happiest discovery for the painter.

The steel paneled body is even a better thing for the painter.

The successful foe of paint and varnish is rust. The metal panel, unless tinned, or coppered, or some other way metallically protected from rust is sure to go, and goes before it starts, that is, the finish chips or flakes before it leaves the repository.

When corrosion is once set up it will not stop under any treatment until it has finished its job. Hammering, sand-blasting, or any other means of making a covering surface will not kill the rust, for as quickly as the metal surface is treated with paint, varnish, oven-baked enamel, the rust goes right on and the finish begins to flake and chip.

It is a steady income to the painter, and he should promote the use of metal body panels, as a purely selfish consideration.

There have been quite a few painting systems planned to resist the oil and grime of the engine and other running parts of an automobile, but everything in the paint and varnish line bows down before rust, whereat the painter rejoices.

VEHICLE AND IMPLEMENT WOOD DIMINISHING.

Consul F. M. Ryder, Rimouski, Canada, says the supply of domestic woods used in the manufacture of vehicles and agricultural implements is rapidly diminishing. In that district, for instance, there is scarcely a sufficient quantity of cherry, ash, and hickory to meet the local demand of the wagon makers; other varieties combining the technical qualities required in these industries are now to be found, in small quantities, in the remote farming districts of the Province, and these woods are expensive by the time they are delivered to the manufacturer. The forestry branch of the Canadian Department of the Interior has been collecting statistics from the agricultural implement and vehicle manufacturers of the Dominion, and these show that 76,474,000 feet of lumber were used by 162 companies, located in six Provinces, during the past year, the aggregate value of same being \$2,513,265, and the average price per thousand feet \$32.86. Cherry was the most expensive of the native woods, at \$104 per thousand feet, and ironwood was the cheapest, at \$15 per thousand feet.

EUROPE OUTSTRIPS US IN MOTOR TRUCKS.

J. F. Singleton, advertising manager of the Firestone Tire and Rubber Co., recently returned from a trip through Europe. He says that there are few cars in Europe compared with the number in the United States, and the European cars are chiefly of expensive design, few low-priced cars being found. On the other hand, the motor truck business in Europe has far outstripped the motor truck business in this country, and the trucks are mostly equipped with tires of French or German manufacture. The roads in Europe are, as a general rule, in good condition, and the taxi-cab service there costs about one-fifth of what it costs here. He says that the best way to see Europe at the least expense is by touring in an automobile, as the roads are good, a person can see places of interest at his leisure, and can put up at many of the first class smaller hotels which are good and not expensive. Mr. Singleton says that the advertising possibilities in Europe are great and that the lack of advertising along rubber lines at present gives a great field in that direction.

CANADA'S LUMBER PRODUCTION.

Consul Frederick M. Ryder says there is an increasing shortage in the amount of hardwoods produced in Canada, and the deficiency is being made up by importation from the United States, the value of which has now reached \$7,500,000 annually. The principal species are oak, hickory, tulip, chestnut, gum, walnut, cherry and hard pine. Of the lumber cut in Canada for 1910, amounting to about 5,000,000,000 feet, one-twentieth consisted of hardwoods, valued at less than \$5,000,000, while the value of the hardwoods imported into the Dominion exceeded this sum by 50 per cent. It would seem that Canada is becoming more and more dependent upon the supply of hardwoods from the United States.

GAVE HIM LUNCHEON.

W. H. McCurdy, the newly elected president of the Carriage Builders' National Association, was entertained at a luncheon at the Queen City Club by carriage manufacturers of Cincinnati. Those in attendance, including the guest, were Messrs. E. M. Galbraith, Henry Ratterman, Theo. Luth, George Brown, Caleb Shipley, Edmund Knapp, A. H. Miller, W. A. Sayers, Frank J. Enger and P. P. Hunter.

TO REPRESENT OWENSBORO WAGON CO.

Owensboro Wagon Mfg. Co. has secured the services of John Brodie to represent them in the states of Georgia and Florida.

IMITATION MOHAIR.

Mr. J. C. Haartz, of the Lowell, Eng., Textile School, says that for the past six years a great many so-called mohairs have been used by the automobile trade for making cape hoods and slip covers. While a certain percentage of this material has been made from real mohair, on a cotton warp, fully 75 per cent has been made of lustre wool, all cotton or various other cheap substitutes. The result has been that users of hoods have experienced a great deal of satisfaction. Some of this trouble has, of course, been due to an inferior grade of rubber interlining and some due to lack of proper care of hoods by users.

Genuine mohair is the hair of the angora goat. It is a hard smooth fibre the separate hairs being constructed just like a wire. It is impossible for dust and dirt to work into it and lodge there permanently, because there is nothing to hold the dirt.

To give the maximum amount of service the fabric should be woven of sufficient weight and constructed closely enough so as to prevent the rubberizing being forced through the face. Quite a lot of real mohair is spoiled by being too lightly constructed and having its dust-resisting qualities destroyed by the compound striking through in coating. A real mohair to give the best results as a cape hood fabric should at least weigh 7½ ounces or more to the yard.

Another prominent factor is the dyeing of the fabric to get a fast color that will stand up in the best possible manner; the warp on which the goods are made should be dyed a fast color and afterwards when the goods are woven they should be cross-dyed.

Many people believe mohairs get dirty quickly and cannot be cleaned. A real mohair of the proper construction when properly rubberized can be easily cleansed and put in practically its original condition by a brisk brushing with a stiff broom. If brushed regularly once every week or two, a genuine mohair hood will wear as long or longer than a hood made of any other known hood material.

One of the chief advantages of mohair as a hood material is that the rubber or waterproof surface being protected on both sides cannot chafe or wear as it will in a cloth where the waterproof surface is exposed on the outside and it will give much longer service than the surface cloths.

Lustre wool being the most common substitute, looks a great deal like mohair when in the piece and probably not one man in a thousand could tell it from the genuine article. But on closely examining the construction of the separate fibre of lustre wool it will be seen to be covered with scaly projections and consequently is about as good a dust collector as could be found. When this fibre becomes wet the projections or scales on the sides of the fibre bend away from the main shaft, and as it dries out these scales mat together, hugging to the main shaft and thus bind in and hold firmly any dust or dirt that may be on the cloth. Dirt thus held it is impossible to remove and this accounts for so many disreputable looking hoods seen on cars at the present time. There are few things that will make a good car look worse than a cheap hood.

The original cloths brought out for the purpose were real mohairs and cost a certain price. The public demanded something that looked like mohair, but cost less and they got it in lustre wool.

Several automobile manufacturers are this season taking up the matter of mohair in the right way by having disinterested textile authorities analyze the materials submitted to them and are thus ascertaining the comparative values. They would not think of guessing at the comparative values when buying steel and have decided that the only reasonable way was to apply the same methods when buying hood materials.

The good offices we do for a man in want, distress or under reproach should be known only to those who have the benefit of them.

Looking Backward -- Looking Forward

Trade Opinions and Forecasts by Vehicle Builders of Distinction. Men Who Feel the Pulse and Diagnose With Skill.

An Eminently Satisfactory Year.

E. M. Galbraith, Anchor Buggy Co., Cincinnati, O.: When we glance over the past year, we are compelled to smile as we think of the predictions for an unusually poor business in the vehicle line made prior to the opening of the season. It is true that after the first of May the volume of orders was not as great as in the year previous, but the year taken as a whole was, we believe, an eminently satisfactory one to those manufacturers who are conducting their business along business lines. As for the future, this we believe, depends entirely upon seasonable weather. An early winter and goods roads in March and April, would make the coming year one of the best that we have ever experienced. A late winter and an over-abundance of rain and snow in March and April would make the season a backward and undoubtedly a discouraging one to both the dealers and the manufacturers. First orders for shipment in January and February are now on file to a number to insure the full operation of our plant for those months. We also feel that we are not over-stating conditions when we say that the carriage trade—manufacturer and dealer—will enjoy a business as large in proportion as does the manufacturer or dealer in any other line.

Beats Previous Records.

Carl P. Schlamp, The Geo. Delker Co., Henderson, K.: Our trade during the twelve months just passed has been excellent, the results were satisfactory and the business done larger than at any previous time. We hear a good deal of complaint just now that orders from the South are very slow in coming in, and that many dealers are unwilling to specify until the cotton is sold. Cotton is being held back because the raisers are not satisfied with the price. This affects our trade to only a small extent, as we have not a great many customers in the cotton raising states. However, cotton is raised in the western part of Kentucky in what is known as the "Purchase," and also in west Tennessee, and conditions there are not quite as good as usual. Our prospects, considering all territory, are equal to those of any previous year. We have many orders for later shipment, and quite a lot of good specifications for early shipment.

Past Twelve Months Best Ever—Immediate Future Not So Rosy.

E. E. Hughes, Hughes Buggy Co., Lynchburg, Va.: Conditions at the present time do not look very rosy, that is for immediate shipment, although the past twelve months have been the best we have ever had. I feel that business will get normal again as the planters find out that they are not going to get large prices for their cotton and will turn their money loose. By not selling their cotton and holding it, it has made the business in the cotton district dead. The tobacco crop, however, they are not feeling so blue over, as they are getting nice prices for tobacco. I hope, however, that business will open up much sooner than I anticipated.

"Flat as a Flounder," but Optimistic.

J. G. Anderson, Rock Hill (S. C.) Buggy Co.: Up to October 1st business was good and everything pointed to a heavy trade, but on account of the drop in the price of cotton things are as "flat as a flounder." Our business is off over 60 per cent, and no prospects for an improvement until the spring of the year.

Trade in this country is dependent entirely upon the cotton crop. If prices are good, trade will be good; if prices are low, trade will be bad. That has been the history every since the birth of Adam. We are optimistic and haven't got the blues, as we shall likely do business enough to keep "soul and body together." But until the price of cotton advances, trade in the cotton belt will be indifferent.

Outlook Very Good Indeed.

Wm. J. Mills, H. H. Babcock Co., Watertown, N. Y.: The outlook for the coming season in the carriage business is very good indeed. Our orders at the present time from August 1st to date are considerably ahead of last year and from the reports we get from our salesmen, the outlook is very good. To be sure the business in the cotton belt just at this time is a little quiet, but assume that it will soon revive.

Running Ten Hours a Day but Dealers Holding Back Specifications.

From a manufacturer who does not want his name quoted: From a portion of our territory our orders for January, February and March shipments are about equal to those of last year, or rather the beginning of the present year, but we just have a report from our Illinois salesman in which he suggests that "Dealers seem to be afraid to buy, some of them seem to think the world is coming to an end." Considering the situation as a whole, it seems that there is considerable hesitation among the dealers as to placing their orders and there seems to be an indefinable fear that business will not be up to the usual volume and for this reason most of them are holding back their specifications. We are running ten hours a day now in our carriage department to enable us to fill our orders for January delivery, and most of these are in our eastern Ohio territory, although we are getting a few less-carload orders from Michigan, Indiana and Illinois.

Looks Like Another Busy Season.

Geo. S. Brown, Brown Carriage Co., Cincinnati, O.: Our business during 1910 and also 1911 was very satisfactory and the prospects for business next season look very good. The orders for immediate shipment in November and December were moderate, but the orders for spring shipment are very satisfactory, so it looks like we are going to have another quite busy season.

Looks for a Banner Year.

Henry Ratterman, Ratterman & Luth, Cincinnati, O.: It is true the past few months have been very quiet ones for the vehicle industry, although there are good and sufficient reasons why they should be, but are pleased to say that the future looks bright. The fact of having had several months of dull business, when Spring opens again, the manufacturers and dealers will, with new vigor, put their shoulders to the wheel and, barring any unavoidable conditions that might arise, there is no reason why 1912 should not be a good buggy year. The statistics which have recently been gathered by some of the leading accessories and vehicle manufacturers show that the vehicle business is not on the decline, but on the contrary, it is on the increase and shows that it is in a healthy condition. We are living in a great and prosperous country and inasmuch as only a small portion of the United States has been developed, there is plenty of room for improvement which is bound to come and when it

does, those contemplating these improvements will need vehicles for many years to come. Good sunshine weather and good prospects, I feel will make a banner year for 1912.

Good Business Due to Advertising.

Robert C. Ilg, O. Armleder Co., Cincinnati, O.: The year 1911 has been very satisfactory from a business standpoint. While we understand in some lines there was a general tendency during the year to hold off buying, still we did not find it so. There is one thing that we did do, and that is we advertised just about twice as much for new business in 1911 as we did the preceding year, and it is for this reason, no doubt, that we obtained the satisfactory results that we did. As far as the season of 1912 is concerned, we really cannot say just what the outlook is, because our season does not open until along in February, but we really do not see why it should not be as good, in fact, better than 1911.

Will Do Double Business in 1912.

E. M. W. Bailey, S. R. Bailey & Co., Amesbury, Mass.: We would say that the past year's business in electric automobiles has been encouraging, but the prospects for the coming year we consider more so. The electric vehicle has advanced by leaps and bounds, particularly in the East, where it has had slow sales. It is destined to take the front and center of the stage in the next few years and a very large number of additional manufacturers are sure to embark in it. We shall certainly do more than double the business next year.

Reports All Point to Satisfactory Business.

Nordyke & Marmon, Indianapolis, Ind.: During the season in which our 1911 production of motor cars was marketed, we found a very ready sale and satisfactory trade. Our production was disposed of readily during the year ending June 1, 1911. Delivery of our 1912 production began in August and trade up to this time has shown improvement over trade in the same period of last season, with prospects very bright for satisfactory trade throughout the balance of the 1912 selling season, which we calculate will end in June, 1912. We have had reports from our connections throughout the country and we can say, without hesitation, that these reports all point to a very satisfactory business throughout the season of 1912.

Look for High-Water Mark Production in 1912.

General Motors Company, Detroit, Mich.: Nineteen hundred twelve holds much of promise for the automobile. During the entire history of the business, there never has been a time at the eve of a new season's production when the automobile held as great a prominence as during the closing months of this year. The automobile has come into its own in the world of big business. It is significant that during a period of more or less depression, either fancied or real, in the country's great industries, the automobile business has been the one notable exception where uneasiness has not been noticed nor retrenchment made. On the other hand, plans have gone rapidly for a high-water mark production in 1912. Through the elimination of waste and saving of time, the automobile has earned its way. It has become an axiom that every automobile sold helps the good roads cause, and every road improved is a direct benefit to the farmer, reducing the cost of his haulage to market, thereby increasing the value of his farm produce, and adding to the valuation of his property. Thus does the automobile play its part as a constructive element.

Expects Big Business for Medium Priced Cars.

J. J. Cole, Cole Motor Car Co., Indianapolis, Ind.: Politics, preceding a national campaign, always plays an important part in the year's business, but for 1912 it will be a business boomer for cars selling around the \$2,000 mark. There has really been only one big change in high priced cars during the past year, the adoption of the Silent Knight motor by the Stearns and Stoddard-Dayton companies. Steady improvements are being made in the cars of the \$2,000 class. Only recently the motor

manufacturers who are building engines for this price cars have hit upon an improvement in the tooling of time gears. This tooth-forming on time gears has been perfected so that silence is obtained and uniform interchangeability secured. During the past year we have found at our factory that material has increased, the cost of labor increased. This has necessarily increased the cost of building our car. But because of the increased demand for cars selling in our figure we are able to do this without much loss.

Outlook Very Bright.

C. F. Egolf, T. T. Haydock Carriage Co.: The past year has been an exceptional one for us in every particular. We have increased our product considerably over any previous year. The outlook for our business in 1912 is very encouraging indeed. We are at the present time running our plant to full capacity, and have business enough booked to keep us running our plant full time until the 1st of April. From our observation the outlook for the carriage business is very bright and we are looking to 1912 as being our banner year.

Satisfied If They Hold Their Own.

W. A. Sayres, Sayres & Scovill Co.: As to the outlook for 1912, we feel if we can hold our own and do as much business as we did in 1911 we will be doing as well as we can expect.

Wants Substitute for Sherman Law.

Name Withheld: A national incorporation act, with Federal supervision as a substitute for the Sherman law, a permanent tariff commission, with a policy of correcting, instead of having a general revision, would be good medicine for present conditions.

ROSE FILES CLAIMS OF SUITS.

The Rose Mfg. Co., of Philadelphia, Pa., is sweeping the country with a lengthening string of suits based on alleged infringement of several patents covering the Neverout combination lamp and license tag bracket, and also infringement of the Neverout number plate bracket for attachment to automobile radiators. To date the suits which the Rose people have filed claim damages to the amount of \$150,000.

The most recent actions instituted are those against the Eberhardt Mfg. Co., the Pennsylvania Rubber & Supply Co., the M. & M. Co., of Cleveland, and the Perkins-Campbell Co., of Cincinnati, which have been filed in the United Circuit court for the Ohio district.

Similar suits are also pending against E. A. Whitehouse Mfg. Co. and LeCompte Mfg. Co., in the District of New Jersey; against Motor Car Supply Co., James H. Lallou, Hugh A. Glackin, William G. Anderson, Frank M. Bell and James L. Gibney & Bro., in the Eastern District of Pennsylvania; against Cox Brass Mfg. Co. and Lowe Motor Supplies Co., Thomas Harper and American Auto Supply Co., in the Southern District of New York.

CONDITIONS IN CINCINNATI.

The expansion of the automobile business has been considerable in Cincinnati, which was slow in taking it up as a manufacturing venture. At the same time it has not interfered with the output of high-class carriages and wagons, for which Cincinnati has enjoyed a world-wide reputation for half a century. In the wagon and carriage trade reports give percentages ranging from 10 per cent decrease to 20 per cent increase, with an average of 5 per cent increase. Based on an output for 1910 valued at \$14,000,000, the business of the past year was not less than \$14,700,000. Those engaged in the manufacture of horseless wagons and parts report increases over 1910 of an average of 20 per cent, which makes the output of the past year about \$4,750,000, and a total for the vehicle-building industry of \$19,450,000, compared with \$18,375,000 in 1910. Comments on trade conditions are full of confidence for the new year.

MANUFACTURE AND UTILIZATION OF HICKORY 1191.

In 1910 the Forest Service published the results of an investigation of the commercial hickories in the United States. In the course of the study certain conditions were found which it was thought could be investigated further with profit to the industries using hickory. Therefore the Forest Service, in co-operation with the National Hickory Association, has now carried out an investigation to ascertain the present methods employed in the manufacture, marketing and utilization of hickory with a view to suggesting improvements. Over 4,000 hickory manufacturers and users responded to requests for information.

Hickory in commercial quantity was once found in every state east and in several states west of the Mississippi River. It reached its best development and was found in greatest abundance in the Ohio and lower Mississippi Valleys. At present it is listed in the lumber cut of 34 States. This is evidence that its range is as wide as ever and that it has maintained a foothold in spite of two or three centuries of use and abuse. It should not be supposed that its quantity is what it once was. No foreign country, except a little of southern Canada, yields hickory, and no foreign country is successfully planting or growing it.

Hickory is often spoken of as though it were a single species, like yellow poplar or beech, yet there are ten species. There is marked difference between some of them in both appearance and properties. All of the hickories are not found in the same region, but frequently several species grow near together. Arkansas has as many as any State, and there, too, is the present center of production.

Hickory does not and never did form pure forests of great extent. The trees are scattered among other timber. It is important that the manner of its growth be borne in mind, for several other factors of its yield are influenced by this. Hickory neither grows like many other commercial timbers nor can it be cut and marketed in the same manner. It is a peculiar wood in several respects—in growth, properties, uses and marketing.

Its combination of strength, toughness and elasticity has made hickory the world's foremost wood for certain purposes. It offers supreme resistance to strains, twists and shocks. Other woods are satisfactory for heavy vehicles where strength is the chief requisite, but for light, graceful, handsome, springy buggies, carriages and traps hickory is unequaled. It goes into wheels, poles, shafts, spring bars and other straight and bent parts. The lightness and resiliency of the American racing sulkeys have won universal admiration, and their superiority is due to hickory. The severe thrust, strain, twist, and compression which automobile wheels must sustain demand spokes of absolutely the best material obtainable, and for this the manufacturer is dependent on hickory.

At present the principal demand for hickory comes from vehicle manufacturers.

Hickory withes—sprouts from 2 to 5 years old, 3 to 10 feet long, and from one-fourth inch to an inch in diameter at the ground, have been cut in countless millions, and every one was a young hickory tree. They were once the common farm repair material for mending gates, fences, wagons, sleds and machines. They tied everything from the broken fence panel to the fodder shock. Nails, rope and wire have been substituted for withes in most farm repair work. The hoop-pole cutter was as great a destroyer. Every one of the untold millions of poles was a promising young tree, the straightest and smoothest to be found and exactly the kind to grow into spoke stock and sucker rods, had it been spared. Hickory hoop poles sometimes sold as low as \$1.50 a thousand—a thousand promising young hickories for \$1.50, because no one had then learned that one mature tree could be worked into a thousand hoops equally as good.

In most instances these uses are unnecessary and wasteful.

They are brought about, however, by present methods of cutting and marketing the stock. The farmer owns the hickory timber and, on account of the scarcity of other wood, is forced to use it about the farm. The sawing is done by mill men, who move from place to place, and use the engine that runs the farmer's thresher, corn shredder, clover huller or ditching machine. The sawyer is paid by the thousand feet, and in his effort to turn out the greatest possible quantity of lumber, carelessly cuts a larger percentage of low grade stock than necessary. Such practice is on a par with a custom, once rather common, of splitting black walnut for fence rails. The difference is that the owners of black walnut know better now, while some hickory owners have the lesson yet to learn.

Statistics collected during this investigation show that 31,000 cords, or approximately 22,000,000 feet, of hickory are yearly demanded by the 473 meat-packing establishments in the United States for smoking meat. That does not include what farmers cut for their own smoke houses, which is probably as much more. More than 25 different woods are listed as suitable for smoking meat, yet all of them together do not equal the amount of hickory. It seems unreasonable to expect packers located near the hickory supply to substitute inferior woods.

No one knows how much hickory is consumed for fuel. One estimate places the amount at 1,000,000 cords a year. That is probably too high. If not, it exceeds in quantity the combined demand for hickory for all other purposes. It is well known, however, that the cutting of this wood for fuel has long been a serious drain upon the supply.

More than 5,000 mills were cutting hickory lumber in the United States in 1908, as reported by the census, and the output approximated 200,000,000 feet. It is necessary to distinguish clearly between hickory lumber and other forms of the wood. Gear woods, rims, and many other commodities may or may not pass through a sawmill. If they do not, they are not listed by the census as lumber, and the 200,000,000 feet reported for 1908 did not, therefore, include all the hickory taken from the forests that year. How much it fell short is not known, but it lacked much of being all. A recent investigation found 131,000,000 in excess, or apparently in excess of what the census reported. This was cut by small dimension mills into strips, billets and various forms of vehicle and other special stock. Some of the 200,000,000 feet reported by the census was subsequently further manufactured into special stock, and some went into floors, bridges, barns, fences and other similar places. Much hickory is split into billets and never goes to a sawmill or dimension mill. Lathes and other machines finish the products.

Hickory is cut by sawmills and dimension mills of all kinds from comparatively large to very small. The sawmills cut the log into lumber, which later is often ripped into dimension stock. The dimension mills cut the log or bolt directly into pole, shaft and rim strips, spoke billets, handle billets and other rough dimension stock. One of the important problems of the hickory situation at this time is the utilization of this remaining thin stand of hickory. Operators do not find it profitable to take it out along with their other timber. They move on, and their log roads go to pieces, their bridges rot down, and their skidways decay or are removed. The hickory is so scattered that the expense of making a special operation to take it out, involving the construction of new roads and bridges, would cut profits very low, or might even involve a loss. Fortunately, hickory is little susceptible to injury from wind after the surrounding protective timber is cut away and it can wait a long time for its market. Nevertheless, it stands idle while many industries need it.

Most mills cutting hickory are equipped for special dimension stock—sucker rods, poles, shafts, handles, spokes, skewers and

parts of farm and textile machinery. One mill may not cut all, but several of the dimensions; others cut one or two. Each kind of mill strains a point to get out of a tree, or from a tract of hickory land, as much stock as possible for its particular purposes. This is known as specializing, and the practice has been criticized on the ground that trees capable of yielding long pieces of clear material are worked into short-length products—an uneconomic practice.

Unnecessarily high stumps are an important item of waste, since some of the best wood is near the ground. Data compiled during this investigation show that the millmen are improving their practice of a few years ago. Trees left standing in a remote situation are not wholly waste. They serve as seed trees, and with the aid of wind, water, birds and rodents, they may stock much open ground with seedlings for the country's future hickory supply.

Occasionally logs are cut several inches longer than necessary and thus several inches must be thrown away. Another waste results from splitting stock instead of sawing it. Much wood is lost because of small defects which a saw would remove, but which can not be split out without sacrificing more or less good timber.

MARKETING HICKORY.

Hickory is marketed unlike any other wood. The sawmills cut other hardwoods for a general market, through which it is distributed to the user. This general market studies the demands of the trade as a whole and calls on all mills cutting each kind of wood to furnish certain sizes and grades for which the trade is in need. Little hickory, on the other hand, goes through a market or distributing yard. It is chiefly cut for a special industry and sold directly to it. Each industry has its own mills in the hickory-producing territory and comes into direct contact with the millmen cutting its raw material.

The little hickory that gets to the wholesaler is chiefly cut 5/4 inch and thicker, suitable for remanufacture into the stock required by the vehicle man or other special user. The inch stock is cut only to square the log and prevent heavy slabbing.

A considerable amount of wood is disposed of to exporters. This is true chiefly in the Gulf region. The practice has been complained of by manufacturers in this country who look with little favor upon the shipping of hickory to foreign countries when it is needed at home. While it is true that all the good hickory is needed by American manufacturers, the man who has it will sell where the price is best; nor is it practicable or desirable that trade should be restrained by laying an embargo upon this wood. Sometimes the long haul to the factory with the high freight, and the short haul to the exporting point with the lower freight, control the direction which the shipment takes. If, however, the extra rigid inspection of export stock results in throwing out so much of it that the actual profit to the seller is not greater than if he had sold at home, the export of hickory will fall off, and the home factories will get what otherwise would have gone abroad.

A leading manufacturer of long and short length hickory products has in successful operation a plan by which chance and accident are largely dispensed with in cutting and marketing hickory, and waste is reduced to a minimum. The company is fortunate in owning or controlling a number of mills, and also a number of factories where the sawmill products are worked up. It is thus in a position to try out plans for controlling both supply and demand, so far as its mills and factories are concerned. A yard has been established at a convenient freight-breaking point between its southern dimension mills and its northern manufacturing plants, and all inspection is done at the yard. The mills ship their rough stock to that point. It is there carefully separated by sizes and grades, and is piled under cover. Since each mill sends all it saws, it can make frequent shipments without waiting to accumulate certain quantities of specified sizes and grades; and, since several mills are constantly

forwarding their cut, the yard is kept supplied with all kinds of products.

The yard sees to it that all the factories are furnished with the sizes and grades needed. It is in a position to notify the mills when certain stocks are short and to order new supplies. By anticipating future wants the factories can have special orders filled against the time of need. In short, the yard is the central point from which the operation of the mills is directed, on the one hand, and the wants of the factories are looked after, on the other.

The successful operation of this plan by a single concern has suggested its adoption by an organization of all hickory factories. Most of the factories are in the North, but a number of them are South. Many northern factories have also established main stationary mills in the South which rough turn the stock sent in by the small portable mills and ship it to their northern factories to finish. The northern and southern factories and stationary main mills own or back a large number of the small portable mills making spoke and handle billets, him strips, and other rough pieces. In many cases the small mills are independent, but on account of nearness to a particular factory or main mill are forced to sell their entire output to it. Comparatively few of the small mills sell to operators that compete for the output of these mills. Such competition, in fact, is limited to the narrow area in which hickory is now quite abundant. The direct and indirect control of the small mills by the factories and the large number of the small mill operators eliminate the idea of organization among the small millmen, the producers. Such an organization, in order to be effective, must be among the factories, the consumers of the rough-turned product. This organization would regulate the economic cutting of stock only, leaving the amount produced and prices to be determined by natural demand and supply.

This plan at first thought may suggest a combination or trust which might become an instrument for limiting the output of hickory. Exactly the opposite is true. The present output is too limited, due to the natural conditions which have been described, and barely meets the needs of the consuming industries. The proposed plan aims solely at getting more useful material out of the present supply. It aims to reduce the waste in hickory to the lowest possible point, and to draw hickory out of those uses for which it is no better than a dozen other more plentiful woods and attract it to those uses where it has no substitute.

More than one central yard would probably be needed to act as clearing houses for distributing all forms of products to the various hickory factories. Mills would be kept advised what products were needed at the factories. It is predicted that in a short time no mill would be cutting hickory into barn floor stuff, but would make it into sucker-rod and ax-handle stock. The members would be told how to cut trees in a way to get the most out of them, to saw logs most profitably, to prevent injury, to lessen loss by checking, what to do with short pieces, and all other information of value in a business way. The manufacturer's wants would be supplied to the end that the hickory he buys may reach him exactly as he desires it. The clearing house would act as a bureau of education, and would push its labors in that field until good hickory ceased to go into wrong uses and every tree cut was worked for all it would make. Moreover, the proposed system would provide an established market and prevent the alternating feast and famine that unsettles the present hickory supply.

Prices, under such conditions, would regulate themselves. For example, if the supply of spokes were greater than the demand while there was a scarcity of handles the price of one would decline and that of the other advance. The mills being kept constantly informed of the state of the market, would naturally cut down on the one commodity and increase the other. In short, the natural law would work out, but work more speedily and with less loss than where the facts governing the market are not promptly made known.

THE CARRIAGE AND WAGON INDUSTRIES.

Preliminary Report Issued by the Census Bureau.

A preliminary statement of the general result of the thirteenth census of establishments engaged in the manufacture of carriages and wagons and of bodies, tops, cushions, hubs, felloes, spokes, wheels, and other materials used in the production of the complete vehicles, has been issued by Census Director Durand. It does not include wheelwright shops or other small establishments. It contains summaries which give the general figures for 1904 and 1909, and compare the different products by kind and quantity. The report was prepared under the direction of Willis M. Steuart, chief statistician for manufactures, Bureau of Census. The figures are subject to such revision as may be necessary after a further examination of the original reports.

Rates of Increase.

The general summary shows increases in six and decreases in five of the items at the census of 1909 as compared with that for 1904.

The capital invested increased 15 per cent; the gross value of products, 3 per cent; cost of materials, 6 per cent; number of salaried officials and clerks, 8 per cent; amount paid in salaries, 21 per cent; primary horsepower, 19 per cent.

The number of establishments decreased 2 per cent; value added by manufacture, 1 per cent; average number of wage earners employed during the year, 10 per cent; amount paid for wages, 2 per cent; miscellaneous expenses, 4 per cent.

There were 5,492 manufacturing establishments in 1909 and 5,588 in 1904, a decrease of 2 per cent.

The capital invested as reported in 1909 was \$175,474,000, a gain of \$23,129,000, or 15 per cent, over \$152,345,000 in 1904. The average capital per establishment was approximately \$32,000 in 1909 and \$27,000 in 1904.

The value of products was \$159,893,000 in 1909 and \$155,869,000 in 1904, an increase of \$4,024,000, or 3 per cent. The average per establishment was approximately \$29,000 in 1909 and \$28,000 in 1904.

The cost of materials used was \$81,951,000 in 1909, as against \$77,258,000 in 1904, an increase of \$4,693,000, or 6 per cent. In addition to the component materials which enter into the products of the establishment for the census year there are included fuel, rent of power and heat, and mill supplies.

Value Added by Manufacture.

The value added by manufacture was \$77,942,000 in 1909 and \$78,341,000 in 1904, a decrease of \$399,000, or 1 per cent. This item formed 49 per cent of the total value of products in 1909 and 50 per cent in 1904. The value added by manufacture represents the difference between the cost of materials used and the value of products after the manufacturing processes have been expended upon them. It is the best measure of the relative importance of industries.

The miscellaneous expenses amounted to \$11,670,000 in 1909 and \$12,113,000 in 1904, a decrease of \$443,000, or 4 per cent. Miscellaneous expenses include rent of factory or works, taxes and amount paid for contract work, as well as such office, and other expenses as can not be elsewhere classified.

Salaries and Wages.

The salaries and wages amounted to \$45,555,000 in 1909 and \$44,944,000 in 1904, an increase of \$611,000, or 1 per cent.

The number of salaried officials and clerks was 6,803 in 1909 and 6,294 in 1904, an increase of 8 per cent; their salaries increased from \$6,581,000 to \$7,960,000, or 21 per cent.

The average number of wage earners employed during the year was 69,928 in 1909 and 77,882 in 1904, a decrease of 10

per cent; their wages decreased from \$38,363,000 to \$37,595,000, or 2 per cent.

The primary horsepower was 126,032 in 1909, and 106,159 in 1904, an increase of 19 per cent.

The average horsepower per establishment, considering all establishments, was approximately 23 horsepower in 1909 and 19 in 1904.

Products by Number and Kind.

The decrease in the number and value of carriages, as shown in the summary, is due largely to the rapid growth of the automobile industry.

Family and pleasure carriages formed the greatest proportion of all vehicles made, being 55 per cent of the total in 1909 and 54 per cent in 1904. The number was 828,411 in 1909 and 937,409 in 1904, a decrease of 108,988, or 12 per cent.

There were 587,685 wagons manufactured in 1909 and 643,755 in 1904, a decrease of 9 per cent. These formed 39 per cent of all vehicles in 1909 and 38 per cent in 1904. The decrease is due to the smaller number of farm wagons built in 1909, there being 505,025 in 1904, as compared with 429,952, or 15 per cent; next to a drop in the number of government and municipal wagons, which fell from 5,308 to 3,102, or 42 per cent; lastly to a loss in public conveyances, which dropped from 2,711 to 2,243, or 17 per cent. Business wagons increased from 133,422 to 154,631, or 16 per cent.

Sleighs and sleds numbering 100,899 were manufactured in 1909 and 127,455 in 1904, a decrease of 21 per cent.

There were 544 automobiles manufactured in carriage and wagon factories in 1909 and 199 in 1904.

There were 121 establishments in 1909, engaged primarily in the manufacture of other products, that made carriages and wagons as a by-product. If these be added to the quantities in the summary, the total number of carriages in 1909 becomes 843,319, of wagons 629,800, of public conveyances, 2,347, and of sleighs and sleds 109,108.

REEVES OUTLINES SCOPE OF INDUSTRY.

Alfred Reeves recently gave out the following statistics with regard to the automobile industry:

"155 factories are now beyond the experimental stage and producing 50 or more cars a year.

"65 companies are now producing motor trucks or commercial vehicles exclusively.

"405,000 cars registered as being in active use in the United States at the present time, with probably 50,000 more cars used where State registration is not required.

"190,000 cars sold during the past twelve months.

"210,000 pleasure cars scheduled for the next twelve months.

"9,000 trucks and delivery wagons now in use.

"18,000 trucks and package delivery wagons to be made in the next twelve months.

"11,400 dealers selling cars in every town of any importance in the country, with a very much larger number of garages.

"82,166 motor cars registered in New York State alone.

"32,400 chauffeurs registered in New York State.

"\$20,000,000 in motor cars and parts will be exported during 1912, based on government figures for the first seven months."

A brave mind can never want matter for liberality in the meanest condition, for when he has nothing of fortune he can give gratitude and love in health, and care and tenderness in sickness.

THE PAINTER'S ALPHABET.

It is one thing to design a good letter, but quite another to put in its proper place—and the neglect of this truism is responsible for half of the indifferent lettering. The first thing to be considered is planning the design. There is a given space to be decorated with lettering. The best results are obtained by roughing squares or shapes where the various wording is to be placed, until a balanced series of shapes is had. Care must be taken that the shapes which are to be left bare must also be pleasing in arrangement. It shows lack of knowledge to resort to the filling up of an ugly space by the insertion of a little curly bit. If any ornament is used, it should be considered in the general planning. In the arrangement and placing of collections of words, care must be taken to emphasize the salient point. It does not follow that the chief words must be much larger than the surrounding matter, although it is usual. Ordinary block letters are the most easily read, but there is nothing in block letters attractive to the eye. A distinctive capital, with an artistic flourish, which does not destroy the character of the letter, but invites the eye to travel to the remaining letters of the word, is an advantage. The artist in lettering, by means of a flourish or distinctive shape, can turn a collection of letters into a word which is impressed at once upon the mind almost before it is read. This is the acme of advertising. The actual shapes of the letters must be decided by the artist, assuming that he is conversant with the various styles of lettering, which is his ground work on which to build those distinctive letters which it is the aim of every artist to create.

Plainness and legibility must never suffer. Fussiness must be avoided. In good lettering there is a dignity which the artist will preserve and intensify, at the same time imparting his own individuality, which should add to the beauty. Spacing is something that is felt rather than learned. Each letter and space should harmonize and balance.

No matter how well a design is planned, formed and spaced, unless the color scheme is carefully considered, the labor has been in vain. A bad color combination will destroy the beauty of the best design. Roughly, a scheme of color is generally evolved during the process of designing; often the dimensions of a letter will be decided by taking into consideration its color and that of the background. The most telling color is usually employed for the important words. Any ornamentation on a design should be of secondary value in color to the whole of the lettering unless it is to be the chief feature, when the lettering should be of lighter color, but never should they be of equal strength, for one is bound to destroy the effect of the other. Harmony of contrast of color is used largely in lettering designs, but it should be between the background and the lettering. Two contrasting colors are usually found to be quite enough to obtain sufficient difference between the lettering. Various shades of the two contrasting colors may be used with safety. Vivid contrasts are dangerous. Two such colors used in equal proportions give a common place and cheap result, whereas, if one vivid color is used largely in the design, and the contrasting vivid color only sparingly, a bright and effective result is obtained.

The main point to be emphasized in lettering is the personal quality. The examples that are put before the artist are never intended to be slavishly imitated, but to be studied. He must consider balance and construction, which underlie the specimens before him, try his hand, suggestively, at such curves or lines as make up the letters he wishes to use, and when he has mastered this, build up his final letters boldly and without nervousness. If anything occurs to him during his study, let him test it, for while the experiment may show good reason why the novelty should have been disregarded, it may be that he may succeed in revealing some quaintness or beauty which, for want of trial, had else lain unsuspected.

It has been repeatedly asserted that the student should take as his copy-piece those letters that were in vogue during the

middle ages. But nothing is to be gained by deliberately choosing a character which, however well understood in that period, is in our day almost unreadable, except by a specialist.

FOREIGN COMMERCE DURING 1911.

The year about to end will show an increase of over 200 million dollars when compared with the preceding year and a larger total than in any earlier year of our commerce. Imports, while falling below those of 1910 in the earlier months, have, in the closing period of the year shown a marked increase, indicating that the total for the year will differ but little from that of 1910, which made the highest record in the history of the import trade. Manufactures exported make their highest record, reaching approximately one billion dollars in 1911.

Considering the great groups of articles, the noteworthy changes are, in the case of imports, a falling off in manufacturers' raw materials and in finished manufactures; in the case of exports, a general increase participated in by all the important groups. Hides and skins show a marked reduction in quantity as well as in value of imports. Tin imports are about the same in quantity but much greater in value, due to higher prices.

Cotton is still the leading article of export, its total for the year, over a half billion dollars.

Considered by countries, large increases occur in the exports to Canada, Germany, Netherlands, Japan, the United Kingdom, Australia, and Belgium, and lesser increases in those to South America, Cuba, China, and many other countries.

FIRE AT ECKHART CARRIAGE CO.'S PLANT.

The Eckhart Carriage Company, Auburn, Ind., sustained a loss fully covered by insurance on January 16, when its two-story frame warehouse, situated on the east side of the city, went up in flames. Referring to the fire one of the officials of the company writes *The Hub* as follows:

We beg to advise that we suffered a small loss by fire on the morning of the 16th inst., same being confined entirely to one of our outlying buildings that was used as a body filling room carrying a reserve stock of bodies and seats. The main factory buildings were not affected at all, so outside of some reduction of our stock on hand we will be subjected to very little inconvenience and practically no delay in filling orders."

OPPORTUNITY FOR A GOOD MAN.

A one-time prominent wagon factory, now closed, will again begin to operate if the right man is found who will assume management and introduce motor wagons and trucks. This factory is located in New England, has facilities for employing from 300 to 400 men, and while the owner would be pleased to have a manager take a financial interest in the institution, but above all a man of sufficient capacity to manage and supervise the business is wanted. Anyone in position to consider the offer will find it to his interest to address Information Bureau, care *The Hub*.

HESS RETIRES FROM FRANKLIN MANAGEMENT.

Herbert Hess, who for the past five years has been associated with the Franklin Automobile Co., of Syracuse, N. Y., latterly in the capacity of general manager, has resigned that office to engage in the real estate, loan and insurance business.

SANTA WAS THERE.

One hundred and ten members of the Cincinnati Carriage Makers' Club attended the twenty-fifth annual dinner the night of December 21 at the Business Men's Club. The tables were banked with holly. Santa was there and remembered each person with a Christmas card.

WISCONSIN DEALERS IN ANNUAL SESSION.

The Wisconsin Retail Implement and Vehicle Dealers' Association, which held its annual convention at the Auditorium, Milwaukee, Wis., December 13, went on record against manufacturers who sell to catalogue houses. Members were of the opinion that manufacturers who sell to firms which in turn reach the consumer by mail are creating unjust competition and they will refuse to do business with such manufacturers.

The question of increasing the membership of the association was discussed at length. Organization is the keynote of all lines of business, said a number of members, and any plan whereby the membership could be augmented should be tried out.

In making his recommendations, Secretary Siebenthal urged a closer co-operation between dealers and manufacturers. "Do what you can to make the relations as pleasant as possible," he said. "Don't give an order to a salesman merely to prevent a competitor from handling the goods and then cancel the order. Remember the manufacturer has some rights, and if you do not want to handle his goods, let him sell to others without placing obstacles in his way."

Herbert F. Lindsay, traffic manager for Lindsay Brothers, discussed freight classification. He said it is of vital importance to the association that freight be properly classified, otherwise shippers would be subject to rates which would be unjust.

The visiting members of the association were the guests of the merchants and jobbers of Milwaukee at a theatre party given at the Shubert theatre.

At the session Tuesday afternoon F. B. Siebenthal, chairman of the special legislative committee, said that since the legislature had made an appropriation of \$750,000 for the manufacture of binder twine at the state prison, Waupun, conditions had so changed that even the Society of Equity is now opposed to the proposition because the state of Minnesota, which has the largest binder twine plant in the country, has offered to furnish Wisconsin farmers with twine at a lower price than that at which Wisconsin possibly can sell it. The association adopted a resolution in which it went on record against a parcels post. The resolution was telegraphed to the Wisconsin senators in Washington.

On Thursday David W. Allaby, the federation delegate, made his report and there were discussions and demonstrations on the best methods of selling a buggy. The convention closed Thursday afternoon after electing and installing the following officers:

President—G. F. Borchard.

Vice-President—Otto E. Shearer, Palmyra.

Secretary—F. R. Siebenthal, Eau Claire.

Trustees—J. B. Watson, Fond du Lac; Wm. Victora, Muscoda; Arnold Johnson, Wittenberg, and E. W. Robbins, Eau Claire.

More than sixty of the biggest manufacturers of the country exhibited carriages, buggies, automobiles and implements in the main hall of the auditorium. They had representatives in attendance for demonstration purposes.

Curtis M. Johnson, Rush City, Minn.; E. W. McCullough, secretary of the National Implement and Vehicle Dealers' Association, and J. A. Craig, Janesville, were among the speakers who addressed the convention.

FOUR-IN-ONE MUNICIPAL MOTOR WAGON.

The municipality of Vienna has acquired a motor vehicle of a new type which can serve as a sprinkling wagon, a fire engine, a street sweeper and as a simple 6-ton truck. To transform the sprinkling wagon into a fire engine it is only necessary to start a separate motor, operating independently of the motor power, and to attach a fire hose to a universal screw plug on the pump. A simple movement lets down the sweepers which operate like the snow ploughs of the street car companies, and when the water reservoir is dismounted, the city has at its disposal an ordinary 6-ton truck.—Automobile-Aviation.

MEETING OF ST. LOUIS CLUB.

At the annual meeting of the St. Louis Implement, Vehicle and Hardware Association held at the Planters' Hotel, December 11, at which about fifty members were present. The following officers were elected.

President, P. E. Ebrenz, John Deere Plow Company; first vice-president, H. P. Hubbell, Cambria Steel Company; second vice-president, A. A. Chappuis, Parlin & Orendorff Plow Com-

P. E. Ebrenz.

pany; third vice-president, Jos. A. Schlecht, Mound City Buggy Company; fourth vice-president, M. H. Murphy, Missouri-Moline Plow Company; fifth vice-president, J. M. Hubach, Pioneer Pole & Shaft Company; treasurer, Geo. M. Hoffman, Republic Rubber Company; secretary, W. C. Howland. This is the seventh time that Messrs. Hoffman and Howland have been elected to their respective positions.

LOCAL CLUB NO. 2 MEETS.

The meeting of Local Club No. 2, of the Mississippi Valley Retail Implement and Vehicle Dealers' Association was called to order at New Haven, Mo., Dec. 15, by O. Graunemann in the absence of President J. M. Munro. L. C. Britt, of the Thomas Manufacturing Co., Springfield, O., and F. H. Becherer, secretary of the Missouri Retail Hardware Dealers' Association were present, and made interesting talks regarding the retail implement trade. Mr. Becherer spoke particularly on mutual insurance and its advantages.

Secretary E. G. Busch gave an outline of the objects of the local club and its connection with the state organization, which brought out a general discussion from the members present. It was decided to hold the next meeting of the club at Washington, Mo., during the month of March, 1912, the date to be fixed later by J. A. Munro, president.

MEYER'S SILK.

The John C. Meyer & Co. at Lowell, Mass., are mighty good silk and thread makers, and they have so successfully catered to the wants of carriage trimmers, by which we include automobiles and all, that Meyer's silks and threads are the wanted article. Not a little of this is due to the personality of Mr. John C. Meyer, who is very popular in this trade.

THIS IS REAL SERVICE.

Valentine & Company are actively at work helping the motor car owner to a knowledge of how best to preserve the car's finish, but it is in all this work holding in view as an object of prime importance the helping of the painter to a better trade and more revenue.

One of the "booklets," of which this is a sample of many, is here reproduced in cover and part of contents. These are being generously distributed and painters everywhere should note the fact for their own benefit.

What is said inside the cover:

The Problem and The Remedy.

The coming of the automobile has presented many new and puzzling problems to the manufacturer of vehicle varnishes.

The hardest of all to solve, has been that occasioned by the destructive action of automobile soaps, against which no varnish



seemed able to stand for any length of time, and under the action of which the lustre of many varnishes seem literally to "vanish in a night."

"Don't use soap" or "Be sure to use a neutral soap," hardly met this problem, for in the first place, the grime, the grease and the road oil collected by the chassis of the car, demanded the cutting action of soap for their complete removal.

And in the second place a truly neutral soap is absolutely without that caustic action which is necessary for cleansing purposes.

Unfortunately the caustic action of the soap does not stop with the oil and grease on the surface of the varnish. It attacks the oils in the varnish itself with the result that the parts of the car where the use of soap is necessary—the hoods, fenders, and particularly the running gear, soon lose all semblance of a varnished surface.

Now the remedy is this: Finish the parts of the car where the use of soap is liable to be necessary with a soap-resisting varnish. The only such varnish is Valentine's Vanadium Chassis Finishing.

A Word as to the Use of Soap.

The soap itself should never be used on the car. The best method is to make up a strong soap solution, the proper proportion being a pound or two of soap to a gallon of water. Heat the water until the soap is completely dissolved. Enough of

this solution can be made up to last a week or two. Then in washing first cleanse the car thoroughly with a hose until all the grit possible has been removed. Add a quart of the strong soap solution to a pail of water, and with a soft sponge carefully wash off the grease or oil. Then rinse thoroughly with clear water and dry with a clean chamois.

Soap should not be used on the body of the car. In the first place it isn't necessary. And in the second place, no varnish has yet been made which possesses the exceptional working and flowing qualities necessary for the largest panels, and at the same time dries hard enough to resist the destructive action of soap.

Vanadium Chassis Finishing makes it possible for the first time to use the soap which the proper cleansing of the automobile demands, without sacrificing the beauty of the finish, which is one of the car's chief attractions. Vanadium Chassis Finishing is \$5 a gallon.

VARIETY OF MOTOR TRUCKS AT THE GARDEN SHOW.

Several makes of motor trucks that are entirely new to the market were exhibited for the first time at Madison Square Garden, New York, during Part II of the automobile show, January 15-20. These are the Locomobile, Lozier, Pope-Hartford, G-M-C Electric, Speedwell and Bronx Electric. The four new gasoline machines are of the heavy truck type, designed along standard lines, with four-cylinder motors located in front under a hood or beneath the driver's seat.

There will be about one-hundred models on display, ranging from a 600-pound package cart selling for about \$650 to seven-ton and ten-ton trucks at more than \$5,000. The engines that drive them include one-cylinder vertical, two-cylinder horizontal opposed, and four-cylinder vertical types.

The electric vehicles also range from small 600-pound closed delivery wagons to five-ton open body trucks. They are driven by single motors and equipped with light or heavy duty batteries which give them mileage capacity of from forty to seventy-five miles on a single charge.

Bodies will be seen in endless variety, because both gasoline and electric machines are made as independent chasses on which any desired style of body may be mounted.

MISSOURI TRADE.

J. C. A. Hiller, labor commissioner of Missouri, says: The capital invested and the value of carriages and wagons made in Missouri steadily increased year by year during the period between 1904 and 1910, demonstrating the importance of this great industry. In 1904 there were 243 establishments, with a production of \$8,469,000. The increase in production amounted to \$791,000, or a little over 10 per cent. In 1904 the capital invested totaled \$5,756,000, and at the commencement of 1910 the amount had increased to \$7,883,000, a gain of \$2,127,000, or about 40 per cent, and this showing is made regardless of the slight decrease in establishments.

The falling off in establishments was partly due to a consolidation of a number of such factories in six or seven cities and towns. The advent in this state of the automobile and auto trucks had little if any effect on the prosperity of Missouri's carriage and wagon shops in the last five years, or otherwise no increase in value could be shown and there would not have been such a large gain in invested working capital.

SMITH TO BUILD COMPLETE TRUCKS.

The A. O. Smith Co., of Milwaukee, is about to engage in the manufacture of the complete trucks themselves. A truck department has been organized and placed in charge of O. M. Babcock, who formerly was with the Kelly Motor Truck Co., and who fills the office of sales manager.

Trade News From Near and Far

BUSINESS CHANGES.

Mr. Baumgartner has purchased the vehicle business of F. B. Lance, in Elkhorn, Neb.

F. A. Young has purchased the stock of buggies, etc., of C. H. Benedict, of Helena, Okla.

C. P. Sheff has disposed of his stock of vehicles, etc., in Lynch, Neb., to Perry Milligan.

John Whitfield has purchased the stock of vehicles, etc., of Geo. A. Morris in Sterling, Kas.

Erwin & Pedley have purchased the stock of vehicles, etc., of C. C. Fairchild, in Bertrand, Neb.

D. A. Alexander has purchased the stock of buggies, etc., of W. S. Thomas, in Huntsville, Mo.

W. S. Marlin has purchased the stock of vehicles, etc., of B. S. Fogle, in Williamsburg, Kas.

J. T. Harrison has purchased the stock of buggies, etc., in Houston, Tex., from T. J. Waller.

Chas. Stewart has purchased the stock of vehicles, etc., of Austin Bros., in Drummond, Neb.

Haufman & Kincaid have purchased the stock of vehicles, etc., of Hill Bros., in Randall, Neb.

The Cozad Implement Co. has purchased the stock of buggies, etc., of J. A. Davis, in Cozad, Neb.

Chisman & Conboy have purchased the implement business of Froemke Bros., in Anselm, N. D.

King & Park have purchased the stock of vehicles, etc., of John P. Pearson, in Oak Grove, Mo.

Wheeler & Williams have succeeded to the vehicle and implement business of Wheeler & Fowler.

J. & G. Watson have purchased the stock of vehicles, etc., in West Chester, Ia., from Dayton Bros.

Bailey & Ellsworth have disposed of their stock of vehicles, etc., in Wellman, Ia., to Giblin & Duffey.

William Rafter has purchased the stock of vehicles, etc., of L. A. McClintock, in White Salmon, Wash.

Holley & Daugherty have purchased the stock of vehicles, etc., of H. K. Smith, in Mount Pleasant, Ia.

Richards & Richards have disposed of their stock of buggies, etc., in Shell Rock, Ia., to McInroy & Stickler.

Perry Kearns & Son have purchased the stock of vehicles, etc., of the Bryan Implement Co., in Vinton, Ia.

The Frank Lynch Co., of Fargo, N. D., has disposed of its stock of vehicles, etc., to the Fargo Implement Co.

German & Lincoln, of Grinnell, Neb., have purchased the stock of buggies, etc., of Carroll Bros., of that place.

E. W. Bratton has purchased a half interest in the stock of vehicles and implements of A. C. Ryan, in Traer, Ia.

The Darling & Freeman Co. has succeeded to the stock of vehicles, etc., of the Crout & Darling Co., in Leslie, Mich.

The Kerte Mercantile Co., of Medical Lake, Wash., has purchased the business of the Washington Hardware & Carriage Co., in Spokane, Wash.

C. S. Love has sold his interest in the firm of Ears & Love, carriage and wagon works at Huntington, W. Va., and has purchased a large farm near Louisville, Ky., which he will occupy the first of the year.

Oresap Bros., who have bought the buggy and vehicle business of W. H. Liles at Humboldt, Tenn., will continue the business at the same stand in connection with their already established business in the same line.

The firm of Maus & Cherrier, at Alton, Ill., has been dissolved, Mr. Maus having purchased the interest of his partner, Fred

Cherrier in the blacksmithing, horseshoeing and wagon making business. Mr. Cherrier will go south or west in the interest of his health.

IMPROVEMENTS AND EXTENSIONS.

W. E. Hogue will rebuild his wagon factory in New Orleans, La., which was recently burned.

The Rex Buggy Company, Connersville, Ind., has increased its capital from \$100,000 to \$150,000.

The Laler Wagon Co., of Chicago Heights, Ill., has increased its capital stock from \$20,000 to \$30,000.

The Nyberg Automobile Company, of Chicago, with a branch factory at Anderson, Ind., will soon establish a branch factory in Atlanta, Ga.

Dan H. Williams has begun the construction at North Yakima, Wash., of a frame warehouse for an implement and vehicle business, which he will open at that place.

The Belknap Wagon Works at Grand Rapids, Mich., built a new power plant and this year will replace the old frame building on Front street with a new 50x80 two-story brick building.

The Moon Motor Car Company is adding another floor to its building at Main and Douglas streets, St. Louis, Mo., to increase its capacity for the manufacture of automobiles and automobile supplies.

According to rumor the Lull Carriage Co., Kalamazoo, Mich., will in the near future erect a large addition to its plant. It is said plans have been prepared for the addition to the factory and that work will probably begin in the near future.

By building three additions to as many different departments, the Hercules Buggy Company, Evansville, Ind., has greatly increased its capacity and will employ two hundred more men. The additions made were to the wheel factory, paint factory and power plant.

George Becker has begun excavating for a new three story building at Sterling, Ill., to be erected in the vacant space between his buggy emporium and the Sterling candy factory. Mr. Becker has decided to materially expand the buggy and vehicle business, and it has become necessary to have more room.

NEW FIRMS AND INCORPORATIONS.

R. D. McKinney has opened a new stock of vehicles, etc., in Sitka, Kas.

T. E. Smelzer has opened a new stock of buggies, etc., in Lawrence, Kas.

Sterling & Sheffield, of Newton, Tex., are about to establish a spoke factory.

W. B. Hickman is about to engage in the vehicle business in Hutchinson, Kas.

E. I. Holland has just engaged in the retail vehicle business in Gunter, Texas.

I. J. Alyea is engaging in the buggy and implement business in Meadow Grove, Ia.

Goodman Bros. have engaged in the vehicle and hardware business in Peterson, Ia.

C. F. Bates has opened a new stock of buggies and hardware in Siloam Springs, Ark.

S. K. Brown has just engaged in the carriage and automobile business in Curtis, Neb.

Aug. Hamke & Son are engaging in the hardware and vehicle business in Merrill, Wis.

The Zimmerman-Kurz Co., to manufacture and deal in wagons and all kinds of vehicles, has been incorporated at Cleve-

land, O., capital \$10,000, by F. W. Zimmerman, F. A. Zimmerman, William M. Byrnes, J. A. Burke, Chas. A. Aaron.

F. L. Spitzenberger is opening a new stock of vehicles and hardware in Dedham, Ia.

Thos. Grimsley is about to engage in the vehicle and implement business in McCallsburg, Ia.

C. A. Johnson has just established himself in the vehicle and implement business in Clarion, Ia.

W. A. Kennedy is preparing to engage in the vehicle and implement business in Estherville, Ia.

The Ellsworth Supply Co. has been incorporated in Ellsworth, Neb., and will handle vehicles, etc.

The C. A. Byers Hardware Co. has opened a new store in Parker, Kas., and will carry a line of vehicles.

The Fischer-Hicklin Mfg. Co. has been incorporated in Sweet Springs, Mo., with a capital stock of \$40,000 to make wagons, etc.

The Davis Carriage Co., capital \$125,000, has been incorporated at East Orange, N. J., by C. O. Geyer, Frank E. Ruggles and others.

NEWS OF THE AUTO TRADE.

Sandusky (O.) Auto Parts and Motor Truck Co. has increased its capital from \$150,000 to \$500,000.

A movement is on foot to establish an automobile factory in Fort Scott, Ark. The plans at the present time are for a \$50,000 company.

Pueblo, Colo., is to have an auto factory. The Byron Motor Company, of Denver, announced that they had taken over the plant of the old Pueblo Steel Wheel & Wagon Company and will at once begin the installation of machinery for the manufacture of the Byron motor truck.

It is announced that the Mitchell-Lewis Motor Company, Racine, Wis., has secured a loan of \$2,500,000 from Chicago and New York banking houses. The purpose is to refund all of their banking obligations and to arrange for a sufficient additional working capital to build auto tops, bodies and commercial trucks.

FIRES.

The wagon factory of Wm. Merritt, in Salem, Mo., has been destroyed by fire.

The vehicle repository of Stone & Munroe, in Morris, Minn., has been destroyed by fire.

Allan Tipton's carriage shop at Mt. Sterling, Wis., was gutted by fire. Loss not given.

The stock of vehicles, etc., of J. F. Pomeroy, in Kamiah, Ida., has been destroyed by fire.

The stock of vehicles, etc., of W. H. Hilme, in Glenwood City, Wis., has been destroyed by fire.

The stock of vehicles, etc., of Laughalette & Maddox, in Roxbury, Kas., has been damaged by fire.

A small blaze in the carriage shop of Augustino & Sweet, at Oshkosh, Wis., did about \$100 damage.

The D. B. Parker buggy factory at Raleigh, N. C., was burned on the evening of December 16. The loss was \$13,000, with \$6,500 insurance.

WESTERN PLANTS CONSOLIDATE.

A deal has been concluded whereby the Colby Motor Company, of Mason City, Ia., consolidates with the Co-operative Farm Machinery Company, of Davenport. The Colby Motor Company was established at Mason City a little over a year ago and already the business has grown to such a volume that increased facilities were immediately necessary. The new company will be officered as follows: President, J. E. Burmeister, Davenport; vice-president, William Colby, Mason City; manager, H. S. Murphy, Davenport; secretary, W. N. Smith, Chicago; counsel, S. N. Hoover, attorney, of Chicago.

DURANT-DORT TAKES UP TRUCKS.

W. C. Durant's Original Carriage Company Enters Motor Vehicle Industry.

The Durant-Dort Carriage Co., of Flint, Mich., has entered the automobile trade. It is building a two-cylinder opposed truck, which will be styled "Best," in what is described as the Flint Motor Wagon department of its plant.

The Best truck, which Durant-Dort will manufacture, will be of 800 pounds capacity. Its two-cylinder motor will be of 4½ inch bore and stroke, and will be positioned under the floor-board in front of the driver's seat. It will employ friction transmission, thermo-syphon cooling and jump spark ignition effected by means of a high-tension magneto and an auxiliary battery-coil system for starting. By way of insuring that a maximum speed of 18 miles an hour cannot be exceeded the motor is equipped with a centrifugal governor which operates through the throttle. The same governor also serves to advance and retard the spark automatically according to the speed of the motor.

The radiator is spring-mounted and connection between it and the motor is made by means of quick-detachable couplings. The radiator itself is held in place by a rod which passes through it from side to side, the removal of which permits the radiator to be taken off easily and quickly, leaving the motor and all the mechanism in front of the car accessible. Semi-elliptic springs support the chassis in the front and those in the rear are full-elliptic. The front wheels are shod with 32x2-inch solid rubber tires and the rear with 34x2-inch tires. Though panel or express bodies are supplied as standard equipment, almost any style of body may be fitted to the chassis to suit the requirements of the purchaser. The standard body is 40 inches wide and the loading space is 63 inches long; the floor line of the body is 31 inches from the ground.

MARSHALLTOWN BUGGY CO. OFFICERS.

At the annual meeting of the stockholders of the Marshalltown Buggy Company, held at the office of the company December 12, a report of the profits made in the business during the past year was read by President L. M. Osborne, after which the stockholders voted to re-elect the former board of directors for the ensuing year. Immediately following the stockholders' meeting the board of directors met and re-elected the former officers of the company.

L. M. Osborne was chosen president; W. A. Tuttle, vice-president; Ray R. East, secretary. The other members of the board of directors are B. W. Sinclair, O. L. Ingledue, D. W. Norris, Jr., G. W. Lawrence and E. S. Ketchum.

CALENDARS, POSTERS, ETC.

The Consolidated Rubber Tire Co. is distributing a fine extra large poster showing the "Kelly-Springfield" celebrated girl, perhaps one of the most popular girls in the trade. One cannot get tired of her and Kelly-Springfield, by its attentions, shows she is its only, truly girl.

A most interesting series of folders are issued by the Buckeye Carriage Body Co., Bellefontaine, O., on which are well and clearly shown the styles of bodies built. We have not seen work better done for the purpose of showing what it is really like.

NEW MANUFACTURERS' AGENCY.

W. T. Wood has retired from the W. T. Wood Company, of Waterloo, Ia., and established a manufacturers' agency under his individual control. His lines embrace wagons, buggies, sleighs, gasoline engines, tank heaters, tanks, pump jacks, feed cookers, silos, litter carriers, sawing outfits, feed grinders and power washers.

Recently Granted Vehicle Patents

- 992,142—Derigible headlight, William B. Austin, Wilmington, Del.
 992,708—Shock Absorbing Apparatus for Vehicles. Charles H. Cox, Los Angeles, Cal.
 992,177—Rubber Tire. Philip Ernenwein, New York, N. Y.
 992,429—Thill Coupling, Willis Johnston, Schnecetady, assignor of three-fourths to N. W. Johnston, Chappaqua, N. Y.
 992,569—Spring Gear for Vehicles. William L. Manning, Wilson, N.C.
 992,517—Steering and Running Gear for Wagons. Alfred T. Newell, Birmingham, Ala.
 992,603—Elastic Tire. Ferdinand Schiller, Prague, Austria-Hungary.
 992,604—Tire. Joseph P. Schmand, Roselle Park, N. J.
 992,457—Shock Absorber. Milton Tibbets, assignor by mesne assignments to Packard Motor Car Company, Detroit, Mich.
 992,620—Wagon Stake. Herman and H. Wesle, Medford, Wis.
 991,497—Thill Coupling. John F. Galvin, New York, N. Y.
 991,612—Cushioned Tire for Automobile Wheels. Simon Gordon, Washington, D. C.
 13,235—(Relissue)—Storm Top for Vehicles. William A. Hunter, Terre Haute, Ind.
 991,792—Stop Board for Wagons, Robert W. Lawler, and H. L. Everhart, Rushville, Ill.
 991,737—Automobile Tire. Samuel J. Moore, assignor of two-thirds to T. Koop and O. J. Boesel, New Bremen, O.
 991,744—Sectional Vehicle Tire. Alexander H. Peloubet, Newark, N.J.
 992,052—Vehicle Tire. Mary A. Phillips, Montreal, Quebec, Canada.
 991,668—Hand Tenoning Machine. Henry O. Taylor, Rockford, Ill.
 991,562—Tire. David C. Thomas, Bronwydd, Llanishen, England.
 991,587—Automobile Lamp. Leo J. Wogenstahl, San Antonio, Tex.
 990,956—Vehicle Wheel Tire. Melville Clark, Chicago, Ill.
 990,848—Tire. James B. Crawford and J. R. Milliken, Sioux City, Ia.
 990,849—Dumping Wagon. Elmer Cronenwett and F. A. Smith, Galion, O.
 990,965—Pneumatic Tire. Perry E. Doolittle, Toronto, Ont., Can., assignor by mesne assignments, to Doolittle Rim Co., Ltd.
 991,437—Shock Absorber for vehicles. Christopher A. Garvey, St. Louis, Mo.
 991,307—Seat and Body of Motor Cars and other Road Carriages. Albert E. Hodgson, assignor to the "Relyante" Motor Works, Wathamstiw, England.
 990,876—Dump Wagon. Charles Howland, Pontiac, Mich.
 991,328—Quick Detachable Wheel Tire. Lewis H. Lamkin, Natchez, Miss.
 991,000—Vehicle Spring. Michael M. McIntyre, assignor to the Perfection Spring Co., Cleveland, O.
 991,349—Hub Attaching Device. Otis A. Murphey, Atlanta, Ga.
 990,915—Steering Wheel for Automobiles. John J. Slepicka, Indiana Harbor, Ind.
 990,931—End Gate Fastener. Angus D. Wagner, Manilla, Ind.
 990,214—Tire. Edward P. Beach, Freehold, N. J.
 990,474—Ventilator and Storm Shield. Benjamin J. Crandall, Chicago, Ill.
 990,241—Log Wagon. William P. Dunlap, Frankington, La.
 990,350—Tire. Sebastian Z. de Ferranti, Grindleford, England.
 990,733—Wagon Axle Clip. Hubert C. Hart, Unionville, Conn.
 990,756—Shock Absorber. John Lend, assignor to Multi Mfg. Co., Chicago, Ill.
 990,664—Vehicle Wheel Tire. Hugh Mulholland, New York, N. Y.
 998,825—Wagon Brake. Logan Alexander and R. H. Lemmon, Peru, Kas.
 993,666—Demountable Rim Construction. Edwin A. Baker, New York, assignor to Rapid Removable Rim Co.
 999,086—Demountable Tire Rim. Bert C. Ball, Portland, Ore.
 998,829—Wagon Brake. Albert A. Barnes, Vancouver, Wash.
 998,998—Vehicle Wheel Tire. Joshua B. Barnes, Fort Wayne, Ind.
 998,671—Vehicle Brake. David F., J. E., J. A. and W. H. Bunch, Black, Ore.
 998,753—Tire. George S. Connor, St. Paul, Minn.
 998,880—Demountable Rim. Perry E. Doolittle, Toronto, Ont., Can. assignor by mesne assignments to Doolittle Rim Co., Ltd.
 999,157—Pneumatic Rubber Tire. Clement E. Ekrode, assignor to J. Ellwood Lee Co., Conshohocken, Pa.
 998,760—Automobile Lamp Controller. Roy H. Eneix and R. W. E. Lowell, Anita, Iowa.
 998,966—Tire for Vehicle Wheels. Stens Heinrich, Differdingen, Germany.
 998,771—Shock Reducer. Raymond L. Herman and L. L. Loeb, New York, N. Y.
 998,846—Automobile Headlight Adjusting Apparatus. Herschel M. Herrold and C. P. Rhoads, Kansas City, Kas.
 990,583—Self Lubricating Wheel. Vernon W. Northrup and M. H. Hurlock, Md.
 990,456—Automobile Tire. Henry E. Rechner, East Toledo, O.
 990,293—Shock Absorbing Device. Emile, Rimalho, Neuilly-sur-Seine, assignor to Societe Anonyme des Suspensions et Roues Fleclbles, Paris, France.
 990,392—Tire Building Machine. Robert Fowley, New York, N. Y.
 990,609—Automobile Tire. George E. Tomlinson, Winchester, Ky.
 990,703—Wagon or Truck Bolster. Roy J. Woodward, Fresno, Cal.
 989,979—Brake for Road Vehicles. James J. O'Doherty, Windsor, Victoria, Australia.
 998,980—Tire. John J. Patton, New York, N. Y.
 998,798—Spring Tire. Harry Pierce, assignor of forty-nine one-hundredths to G. W. Strobe, Kansas City, Mo.
 999,129—Adjusting Mechanism for the Lamps of Automobiles. Russell H. Sphar and E. Ostermier, Charleroi, Pa.
 998,997—Pneumatic Shock Absorber. Giuseppe Taraglio, Rome, Italy.
 999,138—Demountable Rim. Lewis E. Younle, assignor to The O'Gorman Younle Company, Portland, Ore.
 999,631—Wind Shield. Henry L. Corbin and F. S. Martin, Springfield, Mass.
 999,302—Pneumatic Tire. Mark A. Dees, Pascagoula, Miss.
 999,554—Vehicle Brake. David W. Evans, Pittston, Pa.
 999,370—Vehicle Door. William H. Jordan, assignor to Vehicle Storm and Top Co., Knightstown, Ind.
 999,379—Wheel. William B. Lloyd, Yankee, N. Mex.
 999,511—Wheel Tire. Joshua D. Marvil, Laurel, Del.
 999,402—Inflated Tire. Amos J. Roussey, Fort Wayne, assignor of one-third to W. F. McLallen, Columbia City, Ind.
 999,677—Vehicle Seat Back Spring. Charles W. Schultz and E. A. Sweeney, Detroit, Mich.
 999,678—Seat Back Spring. Charles W. Schultz and E. A. Sweeney, Detroit, Mich.
 999,607—Wheel Hub for Automobiles and similar vehicles. Albert P. Stocker, Struthers, O.
 999,350—Wind Shield for Automobiles. Almer B. Thomas, Hardwick, Vt.
 999,609—Cushion Attachment for Wheels. Roy Ulrich, Overton, Neb.
 999,732—Air Brake for Vehicles. Charles Anspach, Amherst, Neb.
 1,000,143—Thill Coupling. Pleasant Bedwell, Charleston, Tenn.
 999,952—Automatic Wagon Brake. John Blaska, Liup City, Neb.
 1,000,069—Pneumatic Tire. Charles E. Brower, Memphis, Tenn.
 1,000,241—Storm Front for Vehicles. William V. Deahl, Martinsville, Ill.
 999,775—Wheel Holding Device. Harve H. Gallagher, Osceola, Tex.
 1,000,000—Vehicle Tire. Francis H. Holton, Akron, O.
 1,000,092—Sleigh Runner. Kinsey Jones, Waukesha, Wis.
 999,810—Tire—David Lippy, Mansfield, O.
 999,826—Vehicle Spring. Randolph M. McGahee, Tampa, Fla.
 1,000,113—Vehicle Brake. John O'Connor, Jr. Excelsior, Wis.
 999,919—Vehicle Brake. James C. Turnbull and B. J. Hatley, Fenwick, W. Va.
 1,000,137—Wind Guard for Vehicles. Martin L. Williams, South Bend, Ind.
 1,000,883—Self-Lubricating Wheel. Thomas G. Aultman, Fairmont, W. Va.
 1,000,886—Wagon Box Fastener. Harvey E. Bart, Broken Arrow, Okla.
 1,000,424—Separable Demountable Rim. George H. McClatchy, Philadelphia, Pa.
 1,000,981—Whiffletree Attachment. William W. Bates, Lindale, Tex.
 1,000,343—Shock Absorber. William N. Border and S. P. Love, Trenton, Mo.
 1,001,348—Tire. John W. Burgess and G. F. Burgess, Brookfield, Mo.
 1,001,349—Axle. Benjamin A. Carlsen, Sioux Falls, S. D.
 1,000,394—Compound Spring Suspension for Vehicles. Jean J. Hellmann, Paris, France.
 1,001,527—Vehicle Brake. Jefferson D. Jarrett, Trenton, Ga.
 1,001,163—Wagon Brake. John Pilman, Louisville, Ill.
 1,001,328—Dump Wagon. Robert M. White and E. T. Adams, Portsmouth, O.
 1,001,492—Armored Pneumatic Tire. Charles F. Williams, Atlanta, Ga., assignor of sixty-two one-hundredths to J. T. Andrew, Montgomery, Ala.
 1,001,802—Demountable Rim. John Baker, Pasadena, Cal.
 1,001,730—Headlight for vehicles. William Clites, Elliott, Iowa.
 1,001,619—Vehicle Assembly Stand. Howard E. Coffin, Detroit, Mich.
 1,001,623—Emergency Tire. Charles M. Culp, South Bend, Ind.
 1,002,046—Elastic Tire. Giles S. Doty and J. D. Show, Philadelphia, Pa., assignors to D. & S. Airless Tire Co.
 1,002,055—Vehicle Spring. Andrew R. Graves, Washington, D. C.
 1,002,151—Detachable Wheel. Barton B. Hill, Stoke Newington, London, England.
 1,001,663—Vehicle Tire. Arthur H. Marx, Akron, O.
 1,002,155—Automatic Wagon Brake. Johan P. and J. P. Jensen and H. C. Petersen, Foley, Brook, Victoria, Canada.
 1,002,071—Wind Shield. Ernest Meier, LaCrosse, Wis.
 1,002,174—Wagon Box. James F. O'Brien, deceased; W. B. Vestal, administrator, assignor of one-half to E. F. O'Brien and one-half to F. Fultz, Cloverdale, Ind.
 1,001,886—Demountable Rim. Elwood C. Phillips, Chicago, Ill., assignor to Phillips Demountable Rim Co.
 1,001,891—Security Bolt for Vehicle Wheel Tires. John D. Rowland, Birmingham, England.
 1,001,697—Automobile Axle. Lewis B. Sharp, Far Rockaway, N. Y.
 1,002,003—Steel Tire. Christian J. Simonson and T. Fagervik, Minneapolis, Minn.
 1,001,902—Wheel Guard. Flurence L. Sullivan, Gordon, Pa.
 1,001,706—Dumping Wagon. Edgar B. Symons, Milwaukee, Wis.
 1,000,905—Axle. Herman Tuller, Bellingham, Wash.
 1,001,790—Whiffletree Attachment. Joseph Whitworth, Creston, O.
 1,002,214—Pneumatic Tire. Alsmie Bernier, Providence, R. I.
 1,002,490—Automobile Lamp Moving Mechanism. Reginald C. Bogue, Medford, N. J.
 1,002,807—Wagon Brake. John B. Clanton and E. A. Beatty, Charlotte, N. C.
 1,002,654—Wheel Tire. Frank Dowd, assignor of one-half to H. H. Dowd, Cleveland, O.
 1,002,416—Shock Absorber for Automobiles and other Vehicles. George C. Martin, Los Angeles, Cal.
 1,002,604—Tire. Farington Power, Kansas City, Mo.
 1,002,452—Hub Attaching Device. James N. Rickards, Ridgely Md.
 1,002,771—Wind Shield. James H. Sprague, Norwalk, O.
 1,003,314—Reinforced Puncture-Proof Tire. John Anthony, Attleboro, Mass.
 1,003,396—Shaft Releaser. Edwin L. Black, assignor of one-half to J. T. Hester, Huntington, Tenn.
 1,002,330—Vehicle Spring. William E. Eastman, Boston, Mass.
 1,003,174—Automatic Vehicle Brake. John D. Ellison, Rives, assignor of one-half to E. B. Chester, Brownsville, Tenn.
 1,002,331—Speed Limiting Device. Henry F. Elshoff, Norwood, O., assignor to Allis-Chalmers Co.
 1,002,916—Sleigh Attachment for Vehicles. Henry L. Jones, Leadville, Col.
 1,003,186—Rubberless Tire for Motor Vehicles. George W. Killin, Huntington, W. Va.
 1,003,363—Tire. Alfred F. Kramer, Freedom, Pa.
 1,003,280—Vehicle Tire. William H. Mahlow, West Haven, Conn.
 1,003,148—Shifting Seat. Robert L. Notman, assignor to McKinnon Dash Co., Buffalo, N. Y.
 1,003,579—Pneumatic Cushion for Vehicles. George J. Bancroft, Denver, Col.

1,003,071—Tire. Edwin A. Sundvall, Stockholm, Wis.
 1,003,689—Buggy Body. Jackson T. Barnett, Columbiana, Ala.
 1,003,728—Detachable Rim Device for Road Vehicles. Alexander Flett, London, Eng.
 1,003,934—Sleighing Attachment for Carriages. James P. McCready, Berlin, N. H.
 1,003,569—Vehicle Brake. William E. Woods, Griffin, Ind.
 Copies of above patents may be obtained for fifteen cents each by addressing John A. Saul, solicitor of patents, Fendall Building, Washington, D. C.

RECENTLY EXPIRED PATENTS OF INTEREST TO THE VEHICLE INDUSTRY.

Patents Expired November 13, 1911.

528,917—Vehicle Wheel. Emilus C. F. Becker, Milledgeville, Ga.
 528,927—Sulky. William C. Diessel, Willis O. Foote and Edward Foote, Mexico, Mo.
 529,001—Pneumatic Tired Wheel. Henry W. Vernon, London, Eng.
 529,007—Wheel for Road Vehicles. Harry Moore, Wellingborough, Eng.
 529,106—Vehicle Tongue. Thomas F. Bower, Upper Sandusky, Ohio.
 529,185—Trotting Sulky. Horace A. Pennock, Minerva, Ohio.
 529,225—Wheeled Vehicle. Charles E. Wnuck, Cincinnati, Ohio.
 529,226—Vehicle Door. Charles A. Wright, Philadelphia, Pa.
 529,327—Combined Anti-rattler and Shaft Support. Edgar C. Hall, Decatur, Ill.

Patents Expired November 20, 1911.

529,368—Mud Guard for Vehicles. Robert A. Day, Harrigate, Eng.
 529,474—Vehicle Wheel. Theodore B. Blosser and John Kunkle, Springfield, O.
 529,525—Anti-Rattler for Thill Couplings. Allan Fraser, Providence.
 529,590—Thill Coupling. George Briwnlee, Narracorte, Australia.
 529,668—Vehicle Brake. Benjamin F. Rickard and William H. Rickard, Harrisonburg, and Samuel S. Miller, Bridgewater, Va.

Patents Expired November 27, 1911.

529,736—Pneumatic Tire. Edwin J. Jenness, Chicago, Ill.
 529,751—Bracket for Vehicle Lamps. Solomon L. Reefy, Edinburg, Ill.
 529,767—Vehicle Brake. Benajah Wilcox, Gibson, N. Y.
 529,780—Carriage Top Spring. Daniel Conboy, Toronto, Ont., Can.
 529,819—Wagon End Gate. Larntine C. Sweet, Loam, Ill.
 529,822—Sulky. William J. Wayne, Decatur, Ill.
 529,825—Thill Coupling. Isaac N. Bowen and Thomas Troxel, Charlton, Iowa.
 529,909—Hub Protector for Wagons. Nelson D. Hodgkins, Marquette, Mich.
 530,003—Running Gear for Wagons. John L. Blake, Waynesborough, Va.

Patents Expired December 4, 1911.

530,109—Carriage or Wagon Jack. Samuel J. Johnson, Leesburg, Va.
 530,168—Wagon Bed Lifting Apparatus. Orlo H. Drinkwater, Cedar Point, Kas.
 530,172—Wheel Rim. Albert C. Fairbanks, Boston, Mass.
 530,251—Shaft Attachment for Buggies. Hiram C. Vaughn, San Francisco, Cal.
 530,387—Vehicle Axle Nut. Fred E. Boss, New York, N. Y.
 530,441—Thill Coupling. John W. Mullins, Fariston and Robert M. Jackson, London, Ky.

The above lists of patents, trade marks and designs of interest to our patrons are furnished by Davis & Davis, solicitors of American and foreign patents, Washington, D. C., and St. Paul Building, New York City.

A TIRE JACKET.

An English idea of an improvement in tire protection is thus described: It is a jacket designed to be slipped over the outer cover or tire proper, made up of cables of fibre wound and interlaced in ingenious fashion to form an endless casing of strength and durability. Its object is to shield the tire from destructive friction with the road, and to form a simple and thoroughly dependable cover which, costing less than the tire, will enable this to be continued in service much longer than if it were exposed to the abrasions and harsh usage of the roads. For over six years they have been under test, and numerous examples of the jackets have run more than 4,000 miles, and the protected tires have outlasted two jackets after more than 9,000 miles. The purpose of the jackets is to take the hard wear of first contact with the roads. Further, by their structure, they are waterproof and punctureproof, and they act as corsets to weakened covers, preventing bursts.

RECEIVER FOR BUGGY COMPANY.

Chas. S. Northern has been appointed receiver for the Atlanta Buggy Company, Atlanta, Ga. This action followed the filing of the petition in bankruptcy by three creditors, namely, H. Scherer & Co., of Detroit, Mich., E. C. Atkins & Co., Atlanta, Ga., and the Standard Oil Company. The petitioners allege that the company committed an act of bankruptcy December 15 by paying the sum of \$1,000 to the Rogers Wheel Works.

REUNION OF MOLLER & SCHUMANN SALESMEN.

The Moller & Schumann Co., Brooklyn, N. Y., had its selling force at the factory three days during the last week of December, for their annual conference. Those present were: J. H. Schumann, Jr., president; A. G. Schumann, vice-president; C. J. Schumann, secretary; F. M. Schumann, treasurer; J. H. Mills, R. H. Adelman, H. G. Bailey, W. B. Bohn, P. Carr, W. A. Getty, Wm. Gloeckner, Jabez Gorham, A. B. Grogan, H. Holzman, H. Kalkbrenner, A. C. Lamar, E. Loeb, F. R. Pomeroy, F. C. Schaefer, O. Smith, A. H. Thieme, S. H. Bodenheim, C. Neues, H. Uehlinger, C. B. Dreyer.

W. R. Hyde, the popular sales manager, was unable to be present, owing to his absence in San Francisco, in connection with the branch recently established there by the house, and he was missed very much.

The first two days were devoted principally to a demonstration of the magnificent line of enamels the house is making, both white and colored in air drying and baking qualities. Not only were the uses fully explained, but tests were made to show how the goods should be manipulated to get the best results. Every one of the men is now fully qualified to go into a factory, take off his coat and show the people how to get results. The last day was given over to selling propositions and ideas were fully expressed by all present and suggestions given looking to an increase in business this year. Everybody had something to say pertinent to the subject, and the benefits derived, especially by the younger members of the staff, are incalculable.

On Wednesday night, December 27th, a fine banquet was spread at the Midwood Club in Flatbush.

The meeting was productive of much good and the men started out the first of the year with renewed energy and a more thorough knowledge of the products of the house.

STANDARDIZING CARRIAGE LEATHER.

A meeting of patent leather tanners was held in Newark, N. J., Wednesday, January 10, many of the trade present including out-of-town carriage and automobile leather manufacturers. A resolution was adopted to make a standard for size and selection on automobile, carriage and furniture leather which puts the leather practically on a tannery-run selection the same as the hides which tanners buy. The standard for size is 45 feet and up on machine and hand buffed stock and 38 feet and up on splits. Special measurements above these sizes will be charged for extra. Of course, leather made from poor quality winter grubby hides will be sold at less than the standard prices for the summer hides that do not run more than one to four grubs.

A resolution of sympathy was also adopted at the meeting concerning the death of Patrick Rielly, and a copy of the resolutions was forwarded to his family.

WANTS CARRIAGE AND HARNESS CATALOGS.

Herman Bros. & Co., Conception, Chili, South America, are desirous of obtaining catalogs, printed matter, prices and terms on American-made carriages and harness. Their New York purchasing agents are Messrs. G. Amsinck & Co., 6 Hanover, New York City; references, R. G. Dun & Co. This firm is one of the largest manufacturers of vehicles in Chili and importers of carriages and harness.

FINAL DISSOLUTION.

Articles of dissolution of the Burg Wagon Company, Burlington, Ia., have been filed. This is the final winding up of the business of the company. The distribution of the assets and a transfer of the manufacturing property have been fully accomplished. The plant of the company was sold some time ago to the Mercer Wheel Company.

OBITUARY

Henry C. Valentine, for many years the president of Valentine & Company, one of the oldest and best known varnish manufacturers, died at his late residence, 131 East 66th street, New York, on Monday, January 15, 1912, after a lingering illness, in the eighty-second year of his age. Mr. Valentine was born in Cambridge, Mass., on April 21, 1830. In the late fifties he entered the varnish business with his elder brother, the late Lawson Valentine. He was elected president of Valentine & Company in 1882, which position he occupied continuously until January 1, 1900, resigning the presidency to become chairman of the board of directors. He occupied the latter position until he retired from business in 1909, owing to his failing health.



Henry C. Valentine.

Mr. Valentine is survived by his widow, a son, Langdon B. Valentine, and a daughter, Mrs. Lewis B. Brown. He was a member of the Union League Club, and a life member of the New England Society.

Mr. Valentine might be fairly called the dean of the fine coach varnish trade, owing to his long and continuous activity in the industry. With his brother he might also be called a pioneer in all that has given prestige to American varnish as a worthy product, because up to the time of the entry of the Valentines in the business there was practically no American varnish of repute. By the most skillful and broad-minded operations they (the brothers and their associates) compelled worldwide recognition that has made an international trade connection.

As a life work this is Mr. Valentine's enduring monument, and we are sure the sentiment of the vehicle trade fully endorses the statement, and will accord to the deceased all honor for his splendid achievement.

Patrick Rielly, head of the leather manufacturing firm of P. Rielly & Son, died at his home in Newark, N. J., January 9, at the age of seventy-eight. He had been ill for three weeks with pneumonia. Mr. Rielly was born in County Cavan, Ireland, and came to this country in his youth. Newark had a few leather shops then and Mr. Rielly went to work in one of them. He stayed five years and then took the position of superintendent of the leather factory of William Dunn. For six years he held that job, during which time he perfected the process of buffing the hide with machinery, the work theretofore having been done by hand. Mr. Rielly desired to obtain an interest in the busi-

ness, but Mr. Dunn objected, so the young leather worker organized a company composed of McClatchey, Rielly and Smith. The last named was former United States Senator James Smith. This firm operated a plant for six years and was dissolved in 1876. Mr. Rielly then started in business for himself and made a specialty of patent leather. The business, which is now at Mott street and Passaic avenue, flourished and his leather was in great demand all over the country. A few years ago Mr. Rielly took his son in the business as a partner. His wife died last May. One son, James E., and two daughters survive.

Andrew Redborg, for many years foreman in the woodworking department at the Newton Wagon Company, Batavia, Ill., died January 2 after a short illness. He was born in Sweden in 1868. He was thrice married and leaves a widow and eleven children.

Albian P. Ham, for many years identified with the carriage manufacturing business in Boston, Mass., is dead.

FISH NOW HEADS STUDEBAKER'S.

At a recent meeting of the board of directors of the Studebaker Corporation, South Bend, Ind., J. M. Studebaker, Sr., was elected chairman of the board and F. S. Fish was made president of the corporation, a position which had been held by Mr. Studebaker. Other officers elected were: Clement Studebaker, Jr., first vice-president and chairman of executive committee; A. E. Erskine, treasurer; Frederick P. Delafield, special counsel, Scott Brown, general counsel and secretary; J. N. Gunn, of New York, general manager of the corporation, whose duties will be to "coordinate the administrations of the automobile division, the horse-drawn vehicle divisions and the harness divisions of the Studebaker business." Mr. Gunn is of the New York firm of Gunn & Richards, production engineers. He already has performed special service for the Studebaker Corporation, and his designation as general manager now makes him a regular member of its staff. The changes made do not affect the positions of Walter E. Flanders as vice-president and general manager of the automobile division, and F. K. Parks as vice-president in charge of accounts.

The net profits of the Studebaker Corporation for the current year, it is said, will approximate \$4,000,000. This exceeds predictions made earlier in the year and is a highly gratifying showing.

REO CO. DECLARES 3 PER CENT DIVIDEND.

The Reo Motor Car Company declared a dividend of three per cent on its \$2,000,000 worth of stock, the money having come from the dividend declared by the Reo Truck Company, a majority of the stock of which is held by the Reo Motor Company. The latter received about \$60,000 from that source when the ten per cent dividend was declared and it was thought at the time that the money might be needed in the business of the Reo Motor Company, but Mr. Olds says that it has not become necessary to do so and that it would be disbursed to the stockholders of the Reo Motor Company as a sort of Christmas present.

FREIGHT RATES REDUCED.

Existing freight rates on vehicles, including self-propelled farm and spring wagons, from Toledo, O., to all Ohio river crossings and to Virginia cities, have been declared by the Interstate Commerce Commission to be unreasonable and unjustly discriminatory as compared with the rates from Chicago, Milwaukee and other points. The decision was rendered by Commissioner Clark in the case of the Milburn Wagon Company, of Toledo, against the Lake Shore and Michigan Southern and other railroads. The commission ordered the roads materially to reduce their rates on all such traffic, when destined to the South or Southeast, by February 1, 1912.

WHOLESALE LITIGATION.

Leonard H. Dyer, of Greenwich, Conn., is preparing to sue "everyone who manufactures automobiles." He has already brought suit against the Palmer & Singer Mfg. Co., of New York, for alleged infringement of his patent No. 657,650, covering a guide plate for change speed levers, but it is in the name of the Enterprize Automobile Co., which apparently consists of himself and his brother, that he will prosecute most of his actions.

He is the possessor of at least two patents which he believes rival the Selden patent in their extent and scope, and which are separate and distinct from the better known group of five Dyer patents which were controlled by the A. L. A. M. The patents are Nos. 885,986 and 921,863, and these form the basis of other suits which have been entered in the United States Circuit Court for the Southern District of New York against the Palmer & Singer Mfg. Co., Winton Motor Carriage Co., the Maxwell-Briscoe Motor Co. Similar actions against a large number of other manufacturers are in the course of preparation. The particular inventions are a gear box, with sliding gear giving a plurality of speeds, one of which is a direct drive and also having a reverse. The later patent, No. 921,963, covers a sliding gear, affording a direct drive and providing for a general arrangement with the engine in front and a longitudinal shaft. Dyer and members of his law firm are full of confidence that the actions instituted and others to follow will result in the general recognition of their claims.

Palmer & Singer, Winton and Maxwell-Briscoe all are members of the Automobile Board of Trade and the suits will be defended by that organization. The patents respectively apply to a guide plate for change speed levers, a unit power plant, a sliding gear with direct drive in special form and two types of gearing at present not in use.

FINE SHOWING.

At the annual meeting of the stockholders of the L. Burg Carriage Co., Dallas City, Ill., the following officers were elected:

President—L. Burg.

Vice-President and Treasurer—F. W. Burg.

Secretary—Homer Lynn Burg.

Directors—L. Burg, O. E. Burg, F. W. Burg, Homer Lynn Burg, C. H. Burg.

A dividend of seven per cent was declared on the preferred stock payable in cash and 17½ per cent on common stock, for which additional stock will be issued to the common stockholders. Business in the carriage as well as in the automobile departments is very satisfactory and prospects good.

COLLAPSE OF LINDSAY AXLE SUITS.

The chain of suits instituted by Thomas J. Lindsay and Willard Harmon, the Indiana inventors who claimed to hold basic patents on the so-called "floating axle," has resulted in the dismissal of their action for infringement against the National Motor Vehicle Co., of Indianapolis, Ind., which was the first of the suits to be filed and the last one to be dismissed. A British patent granted to Elliott in 1893 so clearly antedated all they claimed that they decided to dismiss the action.

PURCHASED THE COLUMBIA PLANTS.

W. O. Allen, carriage manufacturer of Fostoria and his associates, have purchased the plant and stock of the Columbia Carriage Company and the Carriage Woodworking Company, Hamilton, Ohio, from O. M. Bake and his associates, who purchased the plant at a receiver's sale on December 6. The new concern will be operated under the name of the New Columbia Carriage Company.

STEARNS TAKES OVER ROYAL TOURIST FACTORY.

Since the adoption of the Knight engine the by F. B. Stearns Co. that company leased outright the near-by plant of the Royal Tourist Motor Car Co, in Cleveland, the Royal establishment having been at a standstill for months. The Stearns people have removed their body building, upholstering, painting, road testing, final assembly and finishing test departments to the Royal plant, thus giving much more room in the main factory on Euclid avenue which will be continued in full operation with its entire facilities concentrated on the manufacture of the chassis. As fast as completed, chassis are run under their own power to the Royal factory, now styled Stearns plant No. 3—where they are tested out and the complete cars finished. Shipments are made from the Royal plant, and owing to the exceptional railway facilities offered the work of the shipping department will be greatly facilitated.

Meanwhile work on an addition to the Stearns factory is in progress, and it is expected that it will be completed early in this month. The new building will be devoted wholly to machining operations and will materially assist in doubling the Stearns output which is in view.

NEW AUTO SEAT.

The Brainsby adjustable driving and auxiliary seat is one that slides, revolves, is raised or tilted just as is a comfortable arm desk chair, which it much resembles. It is English, it is patented, and a purchaser is sought for the rights in this country. W. H. Tye, Limited, Long Acre, London, with stores at 35 Great Queen street, is the corporation having the salable rights in hand. The many angles of seat, as well as positions make it interesting. It might be well to get the illustrations from the owners.

WHITE TANNAGE.

A process for tanning leather white is being introduced to tanners by the Martin Dennis Co., of Newark, N. J. This firm makes a specialty of originating and developing tanning processes. When it gets a new and valuable process, it offers it to tanners, just as a machinery manufacturer offers new machines. It is expected that the new white tannage will be popular because there is a large demand for white shoes, particularly shoes of white buck leather.

JAPAN SHOP ENLARGED.

The Raser Tanning Co., Ashtabula, O., has enlarged its japanning shop by building an addition to replace the one that burned a year ago. The new addition is a one story re-enforced concrete structure 75x225 feet, which gives a total length of 350 feet to their japanning shop. Auto and furniture leather is the product of the tannery. An overhead automatic sprinkler system is now being installed throughout the various buildings.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department. 5 cents a word; Initials and figures count as words. Minimum price, 30 cents for each advertisement.

HELP WANTED.

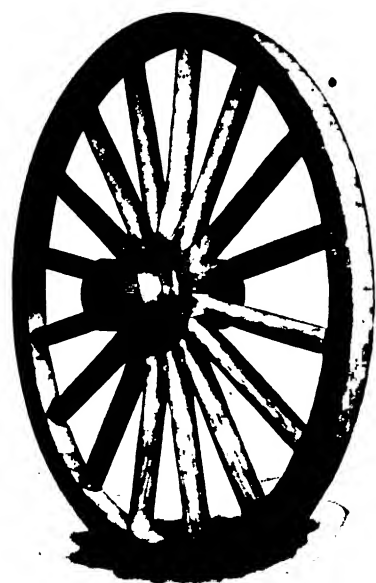
Wanted—Carriage trimmer on light work. Clarence Randall, Newtown, Pa.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

INDEX TO ADVERTISERS

American Roller Bearing Fifth Wheel Co. —	Herbrand Co. 22	Pettingell Machine Co. 5
Bicknell Mfg. & Supply Co. 12	Higgin Mfg. Co. 4th cover	Porter, H. K. 20
Bowling Green Motor Car Co. 12	Hoopes Bros. & Darlington 2nd cover	
Buckeye Handle, Gear & Bending Co... 22	Hotel Cumberland 4	Racine Auto-Tire Co. 18-19
Buckeye Paste Co. 22	Jones & Co., Phineas 18-21	
Burling, W. G. 22	Indianapolis Paste Co. 22	Schubert Bros. Gear Co. 18
		Sherwin-Williams Co. 3rd cover
Consolidated Ruber Tire Co. 1st cover	Keystone Sheet Metal Co. 4th cover	Standard Steel Tube Co. 12
Columbus Bolt Works 4th cover	Keystone Paint & Filler Co. 21	Standard Wheel Co., Terre Haute, Ind... 11
Crane & MacMahon 2nd cover	Keystone Sheet Metal Co. 13	Standard Oil Cloth Co. 4
"Crescent" Body Works 22	Landers Bros. Co. 19	Smith, L. M. & Son 22
Cowles & Co., C. 15	Lewis Spring & Axle Co. 21	Stinson & Son, Edw. 22
		Straus & Son 20
Decker, J. C. 19	Masury, John W. & Son 2nd cover	Schlegel Mfg. Co. 15
Delphos Hoop Co. 22	Mayo Radiator Co. 6	
Devoe, C. T. & Raynolds Co. 3rd cover	Meyer & Co., John C. 22	Timken Roller Bearing Co. 1
Diefenthaler, J. V. 4	Millikan, G. W. 22	
Dowler, Charles L. 22	McKinnon Dash Co. 4th cover	United Rim Co. 2
	Metropolitan Lamp Co. 22	
Eccles, Richard Co. 20	Mohawk Valley Mfg. Co. 18	Valentine & Co. 3
Eureka Mower Co. 20	Moore & Co., Benj. 14	
		West Tire Setter Co. 20
Fabrikoid Co. 4	National Spring & Wire Co. 20	Woodman, Joel H. 22
Fairfield Rubber Co. 19	New Wapakoneta Wheel Co. 1	Willey & Co., C. A. 12
Frost Gear & Machine Co. 21	Ochsner & Sons Co., A. 22	Wilcox Mfg. Co. 17
Gifford, John A. & Son 21	Payne, E. Scott & Co. 20	



ASK FOR CATALOG

No. 10. Carriage and Wagon Wheels.
No. 15. Auto and Motor Truck Wheels.

WE HAVE—FOR FORTY YEARS MADE WHEELS OF QUALITY

¶ Our experience should be worth something to you.

¶ To buyers of wheels not already on our list of satisfied customers, we offer our facilities for producing wheels for

Carriages, Wagons, Automobiles and
Motor Trucks
OF THE HIGHEST STANDARD OF QUALITY

STANDARD WHEEL COMPANY
TERRE HAUTE, IND.



Please mention "The Hub" when you write.

THE MODERN CAR FOR MODERN WAYS

QUIET RUNNING BUT POWERFUL

BEST SHOWING in Chicago-Detroit Reliability Contest. The ONLY CAR in its class making ENTIRE RUN ON ITS OWN POWER.



Model A—Engine, 30 H.P., 4-cycle; transmission selective; wheels 36x2, 36x3½ in. solid, capacity 1500-2000 lbs.

Model B—Engine, 22 H.P., 4-cycle; transmission selective; wheels, 32x3½, 33x4 in. pneumatic; capacity 500-1000 lbs.

The **BOWLING GREEN MOTOR CAR CO.**
BOWLING GREEN, O.

BICKNELL'S No. 90-B Punch and Shear

Designed
for close
work such
as punch-
ing tires
and simi-
lar work.



Made with
automatic
stripper if
desired.
Also made
in larger
sizes.

Write for catalogue of
HANDY MACHINERY FOR CARRIAGE AND WAGON SHOPS
MODERN GASOLINE MOTORS, ELECTRIC LIGHTING PLANTS

Bicknell Mfg. & Supply Co.
JANESVILLE, WISCONSIN

WILLEY'S COLORS

The **RECOGNIZED STANDARD**



C. A. WILLEY CO.

COLORS GRINDERS

and Manufacturers of Specialties in

CARRIAGE, AUTOMOBILE AND CAR

PAINTS

COLORS, VARINSHES, ETC.

HUNTER'S POINT, NEW YORK CITY

THE STANDARD STEEL TUBE COMPANY

Manufacturers of

STEEL TUBING

SPECIAL BENT TUBES for
AUTOMOBILES, MOTOR-
CYCLES, BICYCLES and
MACHINERY of all kinds
a specialty.

Toledo, Ohio,

U. S. A.

Please mention "The Hub" when you write.

ADVERTISEMENTS CLASSIFIED

AUTOMOBILES

Bailey, S. R. & Co., (elec.) Amesbury, Mass.

AXLES

Flint Axle Works, Flint, Mich.
 Frost Gear & Machine Co., Jackson, Mich.
 Lewis Spring & Axle Co., Jackson, Mich.
 Timken Roller Bearing Co., Canton, O.

BODIES, SEATS, ETC. (Wood and Metal)

Burling, W. G., Philadelphia, Pa.
 Crescent Body Works, Reading, Pa.
 Keystone Sheet Metal Co., Ambridge, Pa.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Wiggers Co., Cincinnati, O.
 Woodman, Joel H., Hoboken, N. J.

BOLTS AND NUTS

Columbus Bolt Works, Columbus, O.
 Russell, Burdall & Ward Bolt & Nut Co.,
 Port Chester, N. Y.

BOWS (Automobile and Carriage)

Millikan, G. W., Muncie, Ind.
 Delphos Hoop Co., Delphos, O.

BUCKRAMS.

Landers Bros. & Co., Toledo, O.

BUGGIES.

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

CARRIAGE FORGINGS.

Columbus Bolt Works, Columbus, O.
 Cowles & Co., C., New Haven, Conn.
 Eccles Co., Richard, Auburn, N. Y.
 Herbrand Co., Fremont, O.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.

CARRIAGES AND WAGONS (Finished)

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

CARRIAGE, WAGON AND AUTOMOBILE
HARDWARE, SUPPLIES, ETC.

Chas. L. Dowler, Philadelphia, Pa.
 Gifford & Son, John A., New York City.
 Higgin Mfg. Co., Newport, Ky.
 Payne Co., E. Scott, Baltimore, Md.
 Landers Bros. Co., Toledo, O.
 Mohawk Valley Mfg. Co., Utica, N. Y.

COMMERCIAL MOTOR WAGONS, TRUCKS

Bowling Green (O.) Motor Car Co.

CUSHION MFGRS.

Chas. L. Dowler, Philadelphia, Pa.

COLORS

Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 Valentine Varnish Co., New York, Chicago,
 Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

DASHES, FENDERS, ETC.

McKinnon Dash Co., Buffalo, N. Y.
 Burling, W. G., (Metal) Philadelphia, Pa.

DISPLAY RACKS.

H. G. Dreyer & Son, Cleveland, O.

FIFTH WHEELS.

Eccles Co., Richard, Auburn, N. Y.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.
 American Roller Bearing Fifth Wheel Co.,
 Brooklyn, N. Y.
 Keystone Forging Co., Northumberland, Pa.

GEAR WOODS.

Buckeye Handle, Gear & Bending Co., Alliance, O.

JACKS

Eureka Mower Co., Utica, N. Y.

LEATHER, PATENT AND ENAMELED

Diefenthaler, J. V., Newark, N. J.
 M. Straus & Sons, Newark, N. J.
 L. M. Smith & Son, Newark, N. J.

LEATHER SPECIALTIES

Decker, J. C., Montgomery, Pa.

LINSEED OIL

Sherwin-Williams Co., Cleveland, O.

MACHINERY AND TOOLS.

Bokop, Webb & Palm, Defiance, O.
 Porter, H. K., Everett, Mass.
 West Tire Setter Co., Rochester, N. Y.
 Frost Gear & Machine Co., Jackson, Mich.
 Pettingell Machine Co., Amesbury, Mass.

MACHINERY. (Woodworking)

Bicknell Mfg. & Supply Co., Janesville, Wis.
 Pettingell Machine Co., Amesbury, Mass.

MOUNTINGS (Including Lamps)

Crowe Name Plate & Engraving Co., Chicago
 Ochser & Sons Co., A., New Haven, Conn.
 Metropolitan Lamp Co., Newark, N. J.

MUFFLERS (Auto)

Mohawk Valley Mfg. Co., Utica, N. Y.

PASTE

Buckeye Paste Co., Columbus, O.
 Indianapolis (Ind.) Paste Co.

RADIATORS.

Mayo Radiator Co., New Haven, Conn.

RIMS.

United Rim Co., Akron, O.

ROLLER CHAFE IRONS

Mohawk Valley Mfg. Co., Utica, N. Y.

RUBBER TIRES

Autos, Pneumatics, Etc.
 Consolidated Rubber Tire Co., New York Cy.
 Racine Auto Tire Co., Racine, Wis.
 Carriages, Solid, Etc.
 Consolidated Rubber Tire Co., New York Cy.

SEATS

Schubert Bros. Gear Co., Oneida, N. Y.
 Keystone Sheet Metal Co., Columbus, O.
 Wiggers Co., Cincinnati, O.

SLEIGH RUNNERS.

Schofield & Co., Freeport, Ill.

SHAFT COUPLINGS.

Eccles Co., Richard, Auburn, N. Y.
 Higgin Mfg. Co., Newport, Ky.

SHAFT STRAPS.

Decker, J. C., Montgomery, Pa.

SPRINGS (Cushion)

National Spring & Wire Co., Jackson, Mich.

SPRINGS, GEARS, ETC.

Frost Gear & Machine Co., Jackson, Mich.
 Lewis Spring & Axle Co., Jackson, Mich.
 Schubert Bros. Gear Co., Oneida, N. Y.

THREADS

Meyer & Co., John C., Lowell, Mass.

TRIMMING MATERIAL

Rubber Drills, Enameled Goods, Imitation
 Leather, Etc.

Fabrikoid Works, Newburg, N. Y.
 Fairfield Rubber Co., Fairfield, Conn.
 Standard Oil Cloth Co., New York City.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Landers Bros. Co., Toledo, O.
 Schlegel Mfg. Co., Rochester, N. Y.

TOPS

Schubert Bros. Gear Co., Oneida, N. Y.

VARNISHES, PAINTS AND JAPANS

Devos, F. W., and C. T. Reynolds, N. Y. C.
 Keystone Paint & Filler Co., Muncie, Pa.
 Moore & Co., Benj., Cleveland, O.
 Moller & Schumann Co., Brooklyn, N. Y.
 Masury & Son, J. W. New York and Chicago
 Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 Valentine Varnish Co., New York, Chicago,
 Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

VEHICLES.

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

WHEELS AND WHEEL STOCK.

Crane & MacMahon, New York City.
 Union City Wheel Co., Union City, Ind.
 Gifford & Son, John A., New York City.
 Hoopes Bros. & Darlington, West Chester, Pa.
 Jones & Co., Phineas, Newark, N. J.
 New Wapakoneta Wheel Co., Terra Haute,
 Ind.
 Stinson Edw. W. & Co., Baltimore, Md.
 Standard Wheel Co., Terre Haute, Ind.
 Standard Wheel Co., Toledo, O.
 Shortsville Wheel Co., Shortsville, N. Y.

STEEL WHEELS

Standard Wheel Co., Toledo, O.

WOOD STOCK, BENT WOOD, ETC.

Buckeye Handle, Gear & Bending Co., Alliance, O.
 Crane & MacMahon, New York City.
 Delphos Hoop Co., (Bows) Delphos, O.
 Gifford, John A. & Son, New York City.
 Millikan, G. W., Muncie, Ind.
 Woodman, Joel H., Hoboken, N. J.

WHITE LEAD.

Sherwin-Williams Co., Cleveland, O.

MISCELLANEOUS

Oliver Typewriter Co., New York—Chicago

THE SCHLEGEL MFG. CO.

Canopy Top Fringe
 Broad Lace
 Seaming Lace
 Pasting Lace
 Holder Tassels
 Curtain Cord
 Door Cord
 Rosettes
 Tufts
 Frogs
 Speaking Tubes
 Hat Racks
 Luggage Carriers

Manufacturers of

Fast Color Carriage and
 Automobile Trimmings
 of HIGHEST QUALITY

ROCHESTER,

N. Y.

CARRIAGE, COACH AND AUTOMOBILE
TRIMMINGS AND FORGINGS

ESTABLISHED 1838

NEW HAVEN, CONN., U. S. A.

Which is more perilous
—farming or metal
working?

In occupational injury
where does the
average of fault lie?

What nation sets the
standard in
accident prevention?

On what day
of the week
do the
most accidents
occur?

How much
of the compen-
satory
award
reaches the in-
jured workman?

What relief
system does
most
for indus-
trial efficiency?

Who are more
subject to
accident—
male or fe-
male workers?

Why are New
York accident
rates many
liability
times those
of Germany?

How can
American
liability
methods be
improved?

What are the
defects
of the English
system?

How can our
annual roll of
over
1,000,000
casualties be
reduced?

What propor-
tion of the
insurance
should the
employer bear?

What did
10,000 manu-
facturers
say of our
present liability
system?

AN EPOCH MARKING WORK!

ACCIDENT PREVENTION AND RELIEF

An investigation of the subject in Europe, with special attention to England and Germany, together with recommendations for action in the United States.

By Ferd. C. Schwedtman and James A. Emery

For the National Association of Manufacturers

BASIC facts underlying the whole subject of industrial accidents; the principles of accident prevention; equitable systems of compensatory awards, are embodied in this exhaustive analysis of industrial employments with regard to the safety of the individual, the conservation of human life and the welfare of the State.

A BOOK OF THE UTMOST VALUE

For the Employer, the Workman and the Legislator

CONTENTS

Chapter I. Outline and Underlying Principles of European Compensation Legislation.

Chapter II. Underlying Principles and General Working of the German Scheme of Compensation for Occupational Accidents.

Chapter III. Detailed Description of Some of the Important Features of the German System—Efficiency, Prompt and Proper Medical Aid, the "Doctor Question," the Contributory Principle.

Chapter IV. Obligatory Insurance An Important Factor in Accident Compensation—Various Forms of Insurance, Mutual Insurance, Statistics, Scientific Inspection, Litigation.

Chapter V. Hazardous Occupations—Comparative Hazard of Industry and Farm.

Chapter VI. Prevention of Accidents, Cause and Cure of Injuries, European Safety Museum (Accident Prevention Institutions).

Chapter VII. Cost of Accident Compensation Insurance in Germany in Compari-

son with similar rates in the United States.

Chapter VIII. Employers' Liability in Great Britain Prior to the Compensation Acts.

Chapter IX. The Introduction of the Compensation Principle by the Acts of 1897 and 1900, and the Investigation of the Operation of this Legislation by the Departmental Committee of 1904.

Chapter X. The Final Extension of the Compensation Principle. The Act of 1906. Outline of Its Provisions and Examination of the Nature and Extent of Its Liabilities.

Chapter XI. British Compensation Statistics. The Neglect to Record the Operation of the Earlier Acts Incompletely Remedied by Partial Information Required Concerning the Act of 1906.

Chapter XII. Insurance under the Compensation Acts.

Chapter XIII. Primal Defects of the British Legislation.

Chapter XIV. Finding and Recommendations of the Committee.

APPENDIX.

Copiously illustrated with half tones, charts, and diagrams in color

Prices: Half Morocco [de luxe edition], \$15; Clth \$10

ADDRESS

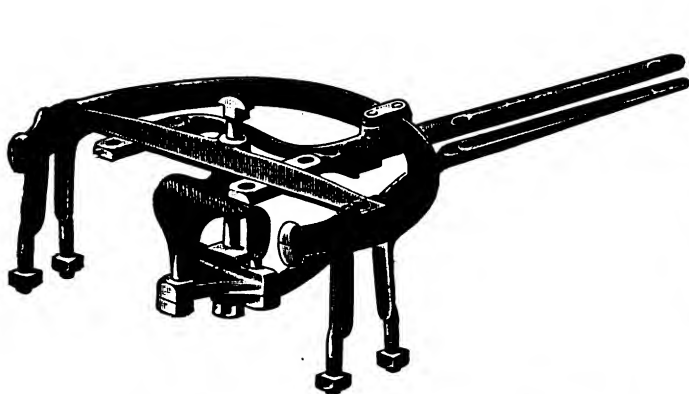
THE NATIONAL ASSOCIATION OF MANUFACTURERS

Terminal Building 30 CHURCH STREET, NEW YORK CITY

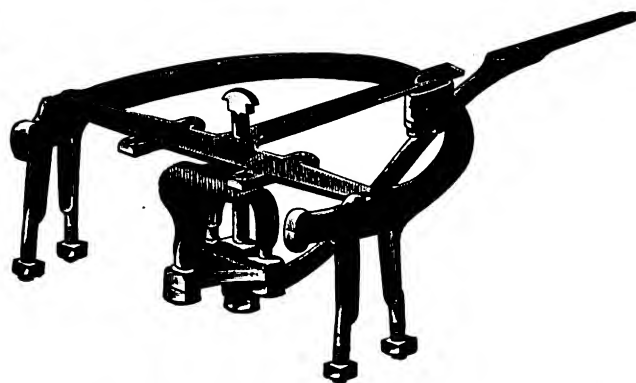
What is total disability
as applied to the injured
worker?

How can the "ambu-
lance chasing" practi-
tioner be eliminated?

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



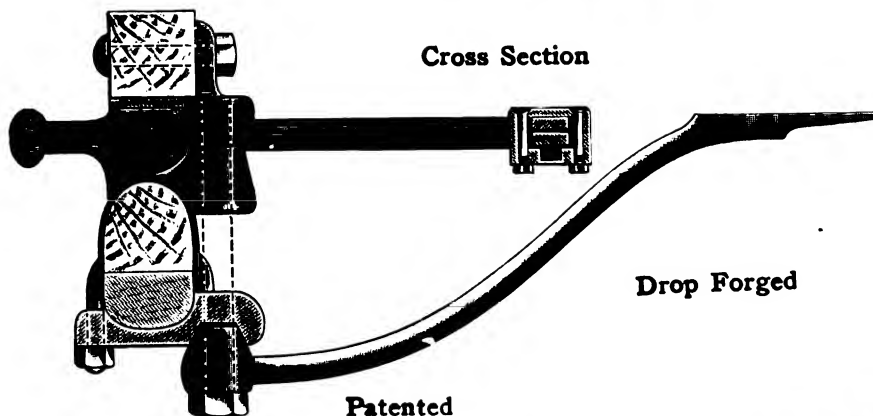
No. 1908—Gear Iron



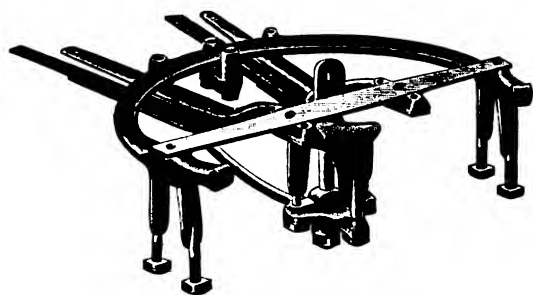
No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

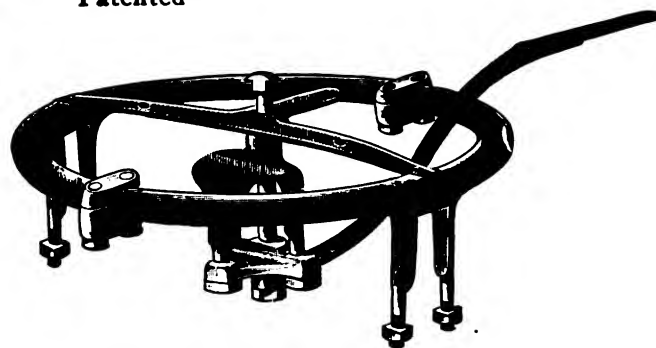
Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.



S
U
R
E
S
A
F
E



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and that's good news involved in the handling of

THE RACINE AUTO TIRE

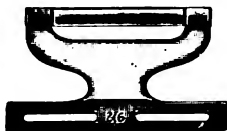
We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

ROLLER CHAFE IRONS, VISES AND HARDWARE SPECIALTIES

Largest Manufacturers of Roller Chafe Irons in the World.
We have just what you want for any vehicle, and remember,
WE SHIP PROMPTLY.



No. 32—For end spring jobs with full length body loops.



No. 69—For Phaetons and Stanhopes.

We also manufacture the cheapest and most durable Automobile Muffler in the world. Can be easily attached to any automobile manufactured.

"We are Known as Prompt Shippers"

MOHAWK VALLEY MANUFACTURING CO.
UTICA, N. Y.

VEHICLES AND GEARS IN THE WHITE



PREMIER
SIDE SPRING GEAR

We also manufacture a full line of CARRIAGE and WAGON BODIES in the white; also LIMOUSINE, TAXICAB, TOURING CAR and ROADSTER BODIES in metal. Fifty styles of gears for Carriages and Wagons; also seats, trimmings and tops of all kinds. Write to us for particulars.

SCHUBERT BROS. GEAR COMPANY
ONEIDA, NEW YORK

ESTABLISHED 1855

PHINEAS JONES & COMPANY

305-313 Market St., Newark, N. J.

AUTOMOBILE WHEELS

For

PLEASURE CARS and TRUCKS

Repairing and truing old wheels a specialty. Experimental wheels a specialty. We furnish and apply the Standard Universal Quick Detachable and Quick Detachable Demountable Rims.

REPAIRING OF AUTOMOBILE TRUCK WHEELS.

Please mention "The Hub" when you write.

CUSTOMER·A·SATISFIED·CUSTOMER

BECAUSE, those cup-like studs that you see in our illustration will grip the ground just where, and just when, the ground needs gripping; so that he is free from the danger of skidding and slipping.

BECAUSE, his tire EXPENSE account will show a difference such as will cause him to talk enthusiastically to others about you and the RACINE AUTO TIRE.

All this counts for good business; so get busy. The RACINE AUTO TIRE is going into the hands of live, pushing dealers. We shall make it equally advantageous to them as to us. Be amongst the live ones. Take our proposition. Do it now; and together let us do it thoroughly.

RACINE AUTO TIRE COMPANY

500 14th Street

RACINE, WISCONSIN



All Steel Piano Box Buggy Bodies One Piece Steel Seats

No More
Checks,
Splits,
Corner
Breaks



Patent
Applied For

Write for our illustrated catalog showing a number of our other seats.

Furnished to most any width desired.

Keystone Sheet Metal Co.

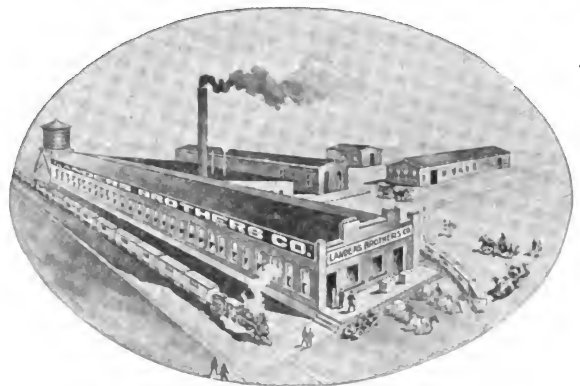
Factory, Economy, Pa.

Office, Ambridge, Pa.

Buckram, Webbing,

Made in Our Factory

Burlap, Strain Straps, Celluloid



Top Material,
Fibre Cord,
Wadding,
Enamelled Muslins, Drills and Ducks

Sheeting,
Bow Lining,
Cushion Canvas,

Landers Brothers Co., TOLEDO, OHIO.

Prompt Shipments

Best Goods

Lowest Prices

Attention!

FALL IN LINE

With the many who are actively interested in our

CUT LEATHER PROPOSITION

We are positive a trial order will convince you that to advertise High Quality Leather, with us means to fill your order with the best that money can buy. We know that you will be satisfied in every respect. - - - - -

Our figures will be mailed you promptly on receipt of your inquiry.

M. STRAUS & SONS

OFFICE:- 440 Frelinghuysen Ave.,

NEWARK, N. J.

"BLACK VELVET" CUSHION SPRINGS

Manufactured Only by the

NATIONAL SPRING AND WIRE COMPANY

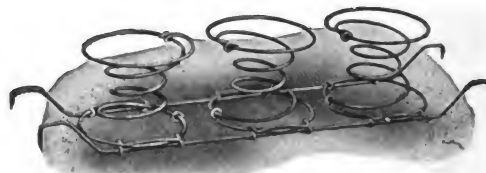
ALBION, MICH. WINDSOR, ONT.

THE SPRING OF QUALITY.



SPRING or SOFT EDGE CUSHION FRAME

For Buggies or Other Vehicles. Built of the Highest Grade of Steel Wire.



STRIP FOR WOOD OR BOX FRAME

PORTER'S BOLT CLIPPERS

"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 Inch.

H. K. PORTER,

EVERETT, MASS.

E. SCOTT PAYNE Co.

OF BALTIMORE CITY

**CARRIAGE AND AUTOMOBILE
HARDWARE**

362 and 364 North Gay Street,
BALTIMORE, MD.

Every Vehicle Dealer Should Read

The Hub

\$2.00 a year. Trade News Pub. Co., New York, N.Y.

Richard Eccles Co., Auburn, N.Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile' Special

Send for Catalogue No. 17.

EUREKA WAGON JACKS



Will easily raise a loaded wagon.
Raises any height desired—not limited to certain heights.

Constructed of steel and malleable iron.

Not a bolt, spring, rivet or ratchet used.

Has nothing to wear out or give trouble.

Pays dealers good profits. Several hundred thousands in use.

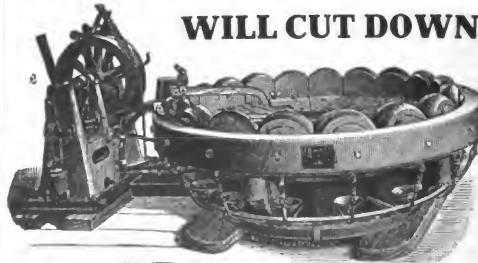
Eureka Mower Company

215-225 Schuyler St.,

Utica, N. Y.

The WEST Hydraulic Tire Setter

WILL CUT DOWN EXPENSE



Tires set cold in one minute. This machine saves time—does the work better and quicker, does a way with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim, and thus make the tire loosen prematurely.

Saves resandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO.,

ROCHESTER, NEW YORK

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

SPRINGS

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

GEARS

We have Automobile
Gears for every purpose
in stock upon which
we can save you money.

FROST GEAR & MACHINE COMPANY
JACKSON, MICHIGAN



KEYSTONE BLACK FILLER

MAKES A PERFECT
ROUGHSTUFF

For Automobile Bodies and Parts

It fills the pores of Metal and Wood perfectly. Sand-
papers easily and produces a fine smooth surface
that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

Jones Wheels

BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.

NEWARK, N. J.

Branch Factory:
12th Ave. and 55th St., New York City.

BUSY BUYERS BRIEFS

John C. Meyer & Co. Threads
Manufacturers of
HIGH GRADE
and **SPOOL SILKS** for Carriage
and Automobile Trade
LOWELL, MASS.

The "CRESCENT" Body Works
Reading, Pa.
Builders of High Grade **Auto Bodies** to order
Of Wood or Metal in the White or Finished.

L. M. SMITH & SON
Leather
Carriage, Furniture and Automobile
NEWARK, N. J.
59-71 Lock St. 234-236 Central Ave.
Office 59 Lock St.

G. W. MILLIKAN
Manufacturer of
HIGH GRADE BOWS OF ALL KINDS
AUTO BOWS a Specialty.
Muncie, Ind.

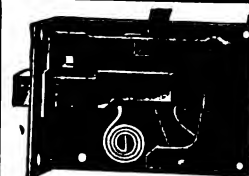
CHARLES L. DOWLER
CARRIAGE AND WAGON HARDWARE
108 North Third St., Philadelphia, Pa.
CUSHION MAUFACTURER
Pure Stearic Acid Candles. Wheel Stock. Snow
Flake Axle Grease.

Special Carriage Trimmers Paste
GUARANTEED VERMIN PROOF
Get our prices on our No. 38 before
making your 1912 contracts.
BUCKEYE PASTE CO.
COLUMBUS, OHIO *The Hub*

METAL PARTS FOR MOTOR BODIES
Hammered Work a Specialty
Fenders, Gasoline Tanks, Japanning Ovens
W. G. Burling 1924 Commerce Street,
PHILADELPHIA, PA.

DELPHOS HOOP COMPANY
MANUFACTURERS OF
HIGH GRADE BUGGY and AUTOMOBILE BOWS
Delphos, Ohio
No Order Too Large Or Too Small *Mention HUB*

Carriage Trimmers' PASTE
Fourteen years the standard
OUR LATEST PRODUCT
"Trimmers' Stickstay"
A Sure-Sticking Dry product that WILL NOT FREEZE.
Free Samples on Demand.
INDIANAPOLIS PASTE CO., Indianapolis, Ind.



A. Ochsner & Sons
COMPANY
1061 State St. N. H. Conn.
Auto and Carriage
Locks, Hinges, Fix-
tures, Etc., and
Bodymakers Tools

Quality, Style, Durability and Quick
Delivery.

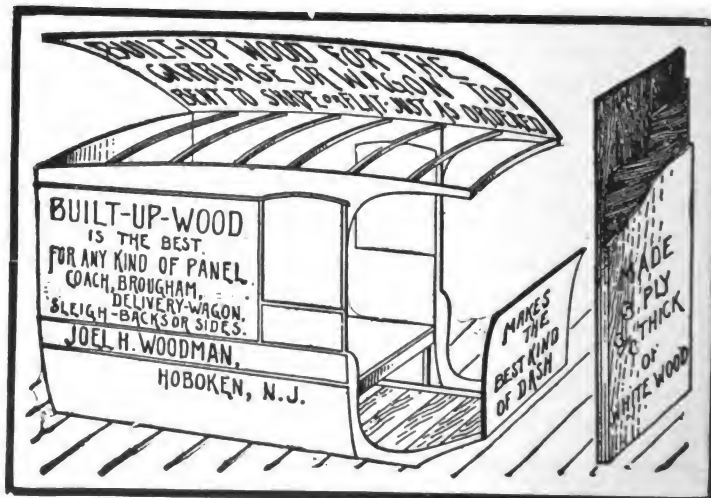
The Edward Stinson Mfg. Company
VEHICLE WHEELS
327-335 North Street, **BALTIMORE, MD.**

H. Weichhold L.D. Phone, 2290-W Market
METROPOLITAN LAMP COMPANY
Manufacturing and Repairing of
AUTOMOBILE SEARCH and SIDE LAMPS
COACH and CARRIAGE LAMPS
Makers of All Kinds of Metal Goods. Nickel
and Silver Plating.
24 Mechanic St., **NEWARK, N. J.**

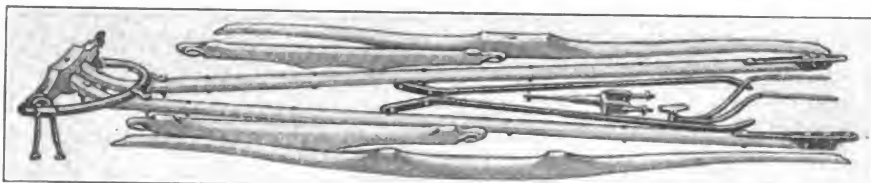
The Herbrand Company
Fremont, Ohio.

MANUFACTURERS OF
HIGH GRADE
CARRIAGE AND AUTOMOBILE
FORGINGS

AND DROP FORGED WRENCHES



The Buckeye Handle Gear & Bending Co.
ALLINACE, OHIO
Manufacturers of Gear Woods
OUR OLD RELIABLE GEAR SET
The Most Complete Set on the Market. Write for Catalogue and Prices



Subscribe
Now for

THE HUB

\$2.00
Per Year

Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.



You Need Dependable Reds

There are a great many reds on the market, but few possess the dependable color tone which is essential for coach and carriage finishing. Reds between a vermillion and a carmine seem to be in vogue and we have just the right shades in

SHERWIN-WILLIAMS

FREE FLOWING NATIONAL REDS

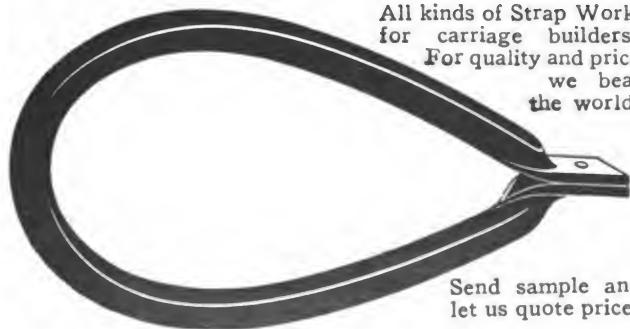
THEY are exceptionally brilliant and are offered in two individual and distinct shades, light and dark in Color Varnish form. These reds are especially adapted to the trade because they hold their original color permanently when exposed to the severe service to which the vehicles are subjected. Being ground very fine, they have exceptional flowing qualities and can be safely applied on the largest panels. The National Reds will please your customers, as the shades are attractive and represent in tone the newest idea in 1912 colors. Write for a color card. Address nearest office.

THE SHERWIN-WILLIAMS CO.
PAINT AND VARNISH MAKERS

FACTORIES: CLEVELAND, CHICAGO, NEWARK, MONTREAL, LONDON, ENG.
SALES OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES

All kinds of Strap Work
for carriage builders.
For quality and price
we beat
the world.



Send sample and
let us quote prices

J. C. DECKER

Montgomery Pa.

THE FAIRFIELD RUBBER COMPANY

Manufacturers of

Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.

FAIRFIELD,

CONNECTICUT

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



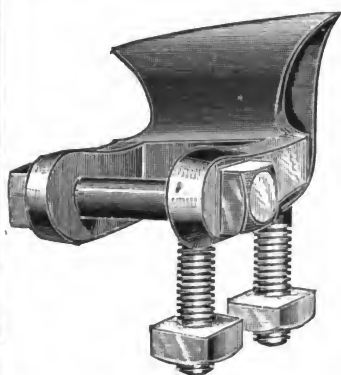
No. 263-N with Nickel Rail.

ARE YOU IN LINE

With the Leaders for 1912?

THEY WILL USE DASH RAILS

Welded Solid To The Dash Frame



Skewed Shaft Couplings

Regular or Oval Patterns
For High Arched Axles

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



PLANHARD CARBURETORS

Are not only different but show GREATER
EFFICIENCY than Any Other on the market

THE PLANHARD is a carburetor and not a mixing valve with
springs and other delicate parts difficult to adjust, liable to get
out of order. The ONLY ball-type in the world on which the air
valve can be adjusted while the motor is running.

THE PLANHARD IS SECOND TO NONE
in the carburetor field to-day
For Tractor, Motor Truck and Marine Motors

Some Reasons :

Center Draft—
Air passage
surrounds noz-
zle and insures
greater air ve-
locity and a full
cylinder at the
highest speed.

**Auxiliary Con-
trol**—Six bronze
balls all of an
equal size and
weight take
care of inter-
mediate motor
speed, giving
the Planhard a
greater range.

More Reasons-

Spray Nozzle,
being cup shap-
ed, makes it
easier to start
motor with a
Planhard than
with any other.

Float Control—
Knife edge seat
ball joint gives
positive float
action, and
prevents leak-
age, no matter
what position
carburetor is in

The Planhard Makes Good

To prove it we will send you a PLANHARD on trial. Write us.

THE PLANHARD MFG. CO.

Eastern Sales Office,
The Bourse, Philadelphia, Pa.

Kokomo, Ind.

The Higgin

LINE OF CARRIAGE TRIMMINGS

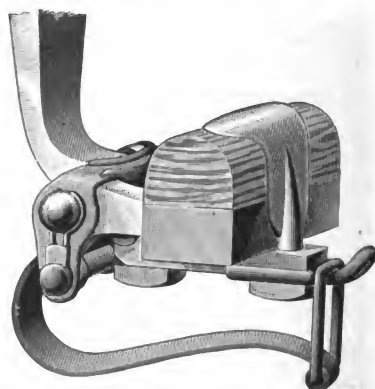
KNOBS



No. 70.



No. 133



(Closed.)
The Higgin Quick Shifter.

KNOBS



No. 72.



No. 130.



Full Leather Nut



No. 74.



Black Japan Nut

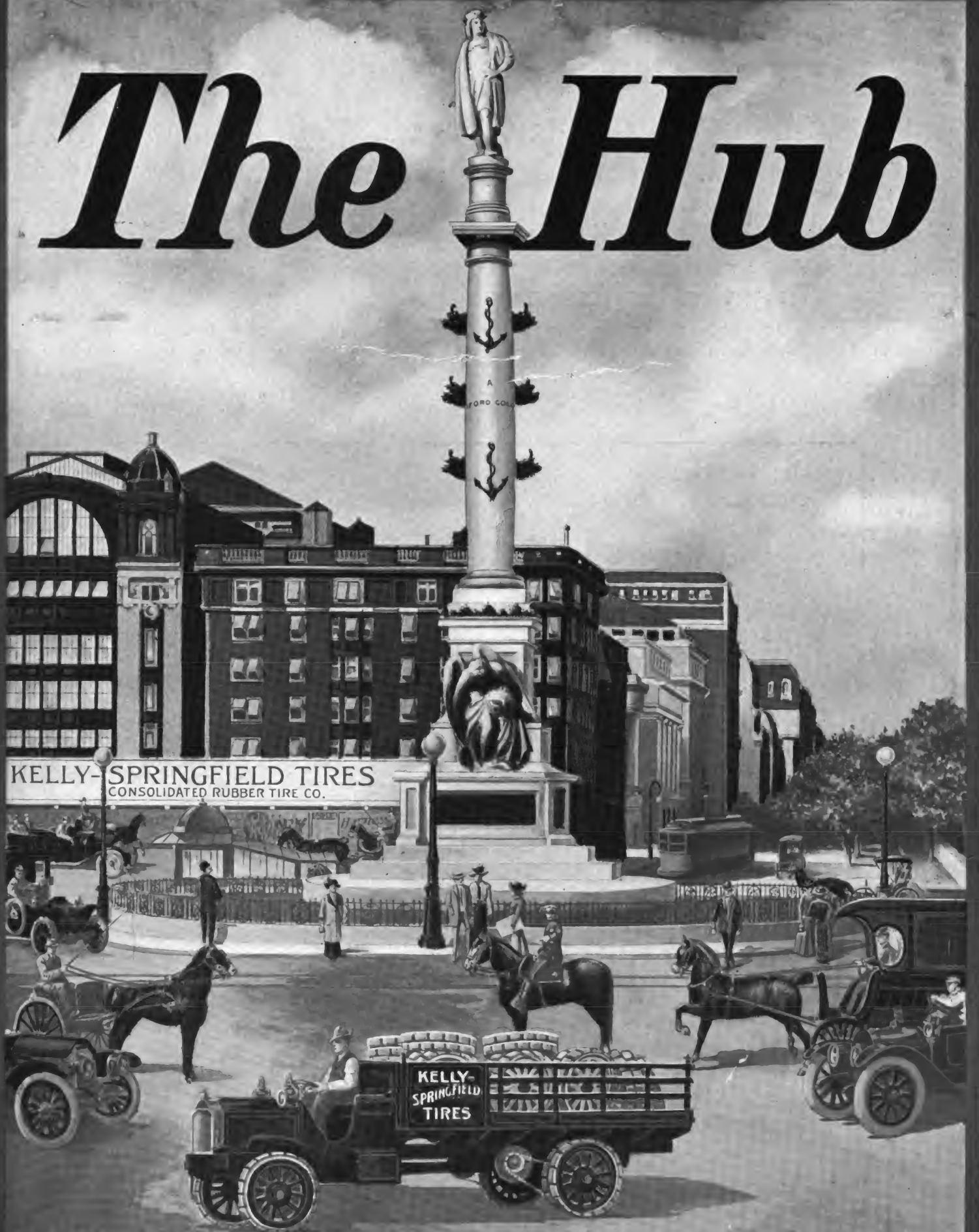
QUALITY UNSURPASSED.

Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co.

Newport, Ky.

The Hub



TRADE NEWS PUBLISHING COMPANY
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN

STAR or KENNY

Sweet Concealed Band

WOOD HUB

WARNER

WHEELS

HEAVY and LIGHT

for

CARRIAGES

WAGONS and

TRUCKS

IF YOU WANT THE BEST TRY OURS

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York,

Chicago,

Minneapolis,

Kansas City



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT,  ACORN,  and STAR  BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO.

RICHMOND, VA.

For Export Prices apply to the New York Office.

Add to your profits and your business reputation

Sell Wagons With Timken Roller Bearing Axles

Get the immediate and larger profit there is in such wagons and make pleased customers who will advertise you.

REMEMBER:-

Timken Roller Bearing Axles being adjustable for any and all wear, eliminate all axle troubles due to wear. They reduce draft 50 per cent, help your customer cut feed, shoeing, harness and repair bills in two and are

Guaranteed for Two Years

Send for Catalog and Price List

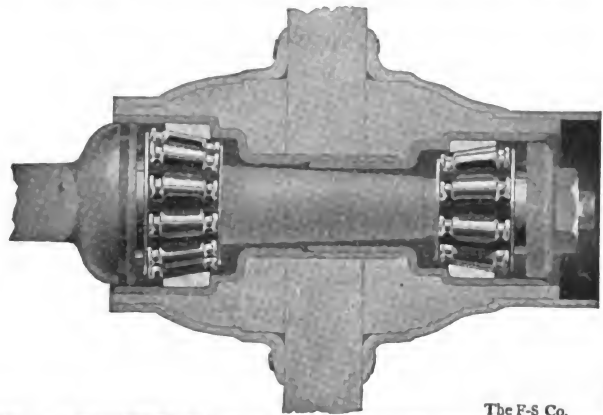
**The Timken Roller Bearing Co.,
CANTON, OHIO**

NOTE—We make Timken Roller Bearings for all automobile applications.

NOTE—Pleasure and Commercial Car Axles and Jack Shafts with TIMKEN ROLLER BEARINGS furnished by the Timken-Detroit Axle Co., Detroit, Mich.

New York Office: 68th and Broadway.

Chicago Office, 1347 S. Michigan Ave..



The F-S Co.

VEHICLE WHEELS OF REAL WORTH

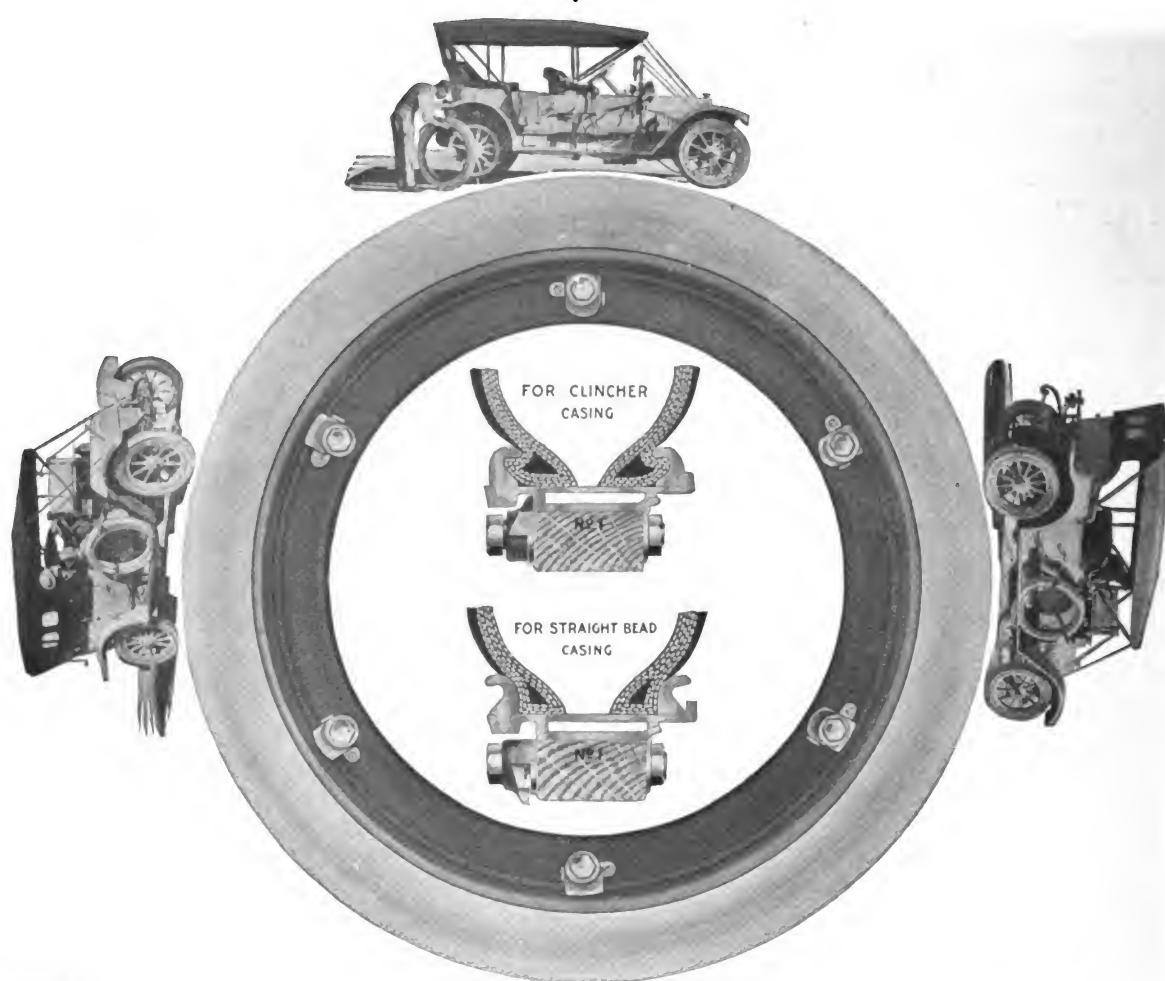


We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Saryen, Warner, Compressed Band and Wood Hub. Send for our Price List.

**THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO**

Please mention "The Hub" when you write.

*-The CONVENIENCE of MOTORING
CENTERS ON THE CONVENIENCE
of YOUR RIM EQUIPMENT*



Standard Universal Rims

Save Time, Muscle and Expense

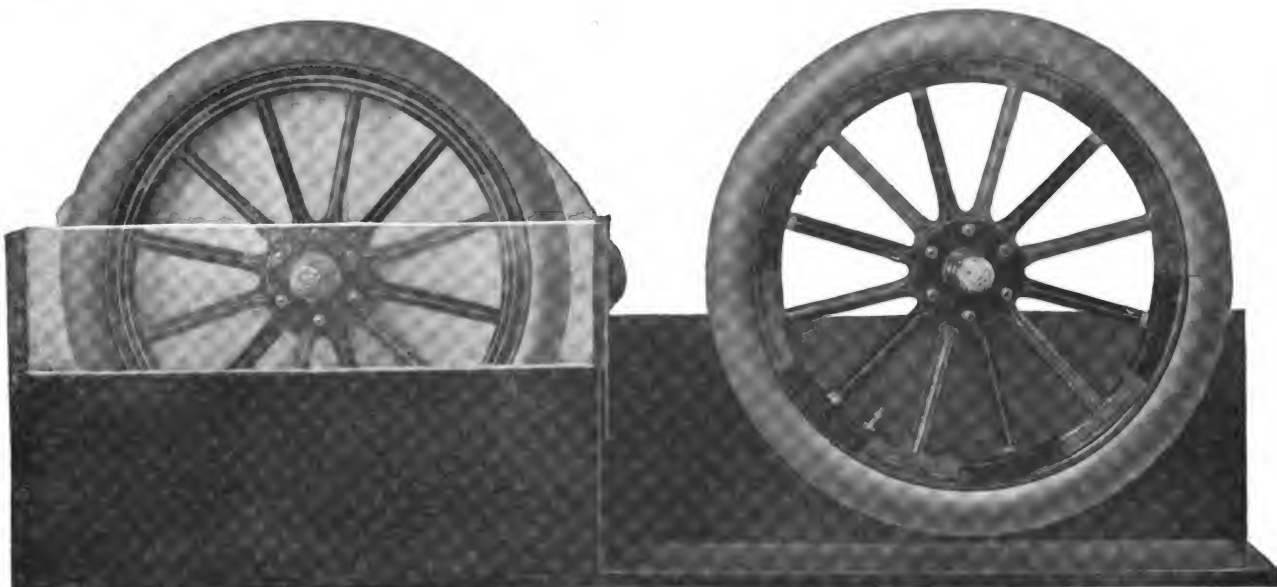
THAT'S why the manufacturer and dealer want them on the cars they sell. Two turns unlocks the rim for demounting. Two turns locks it in place. It takes only a minute to shift punctured tires. Both straight or clincher casings can be used on the same rim.

EIGHTY-SIX per cent of all automobile makers using demountable rims have adopted **STANDARD UNIVERSAL RIMS**. You can't sell the manufacturer something the consumer doesn't want. He knows the best rim made. Demand them on your new car, reduce your tire expense and get there and back on schedule.

Send for our Free Descriptive Rim Book, No. 609.

UNITED RIM COMPANY
AKRON, OHIO

The Varnish That Defies Soap



A startling demonstration of a Varnish absolutely unharmed by the caustic action of automobile soap—a feature of our exhibit at the automobile shows this winter.

Very likely you have seen the wheel revolving in the soapy water at our booth and have noted that the finish on half the spokes remained in perfect condition, while that on the remaining spokes lost its lustre before your eyes.

Six of the spokes of the wheel are finished with the best automobile gear varnishes heretofore made. They cannot withstand soap. The other six spokes are finished with

VALENTINE'S VANADIUM CHASSIS FINISHING

These spokes stand up absolutely unharmed after weeks of exposure to soap and water.

Every automobile manufacturer, every dealer, every owner knows, after sad experience, that there has been no finish until now that has not been literally eaten up by soap. The condition of the hood, fenders and all the underparts of every

automobile, after a few months of use is testimony for all the world to see.

VALENTINE & COMPANY'S NEW VARNISH

on a chassis will remain in perfect condition for months after other varnishes have been ruined.. Prove this varnish for yourself.

We have prepared small pieces of tin, varnished on one side with one of the best known automobile gear varnishes and on the other side with Vanadium Chassis Finishing Varnish. If this tin is left in a strong solution of soap—say a pound to the gallon—for thirty minutes the old-fashioned gear varnish will lose its lustre. Our Vanadium Chassis Finishing will remain unharmed.

This bath in a strong soap solution is equivalent to a month or more in the garage.

Write for this tin. Just fill out the coupon and we will send it to you at once with attractive descriptive booklets.

VALENTINE & COMPANY

257 Broadway,
New York

343 So. Dearborn St.,
Chicago.

74 Pearl Street
Boston.

Name
Address
City
State
Cut off and mail to
Valentine &
Comp'y
V.C.F.

LOOK FOR THIS



Meritas Leather Cloth

Patent Leather and Imitation Rubber Finishes made in
Muslin, Drill & Duck for Carriage & Automobile Trimmings.

AT YOUR JOBBERS

The "MERITAS" trade mark on the back guarantees perfect quality — *Write for Sample Book*

Standard Oil Cloth Co.

320 Broadway

NEW YORK

TRADE MARK
FABRIKOID

MACKINTOSHED FABRICS FOR AUTO and CARRIAGE TOPS

We offer a complete line of fabrics for auto carriage tops, curtains and upholstery.

MOHAIR MACKINTOSHED CLOTH.—Our waterproofing process is superior to that used by other manufacturers of similar fabrics. This is guaranteed against leakage for one year. Pleasing patterns, standard widths and highest quality are other advantages which adapt it to the requirements of makers of tops for high grade autos and carriages.

FABRIKOID LEATHER FOR UPHOLSTERY—This is an improvement on leather and rubber for upholstering and trimming autos and carriages. It is durable, easily applied, quickly cleansed, will not fade, crack or peel—guaranteed.

Samples and Prices sent on request.
Address Dept. No. 269.

FABRIKOID WORKS, WILMINGTON, DEL.
(E. I. du Pont de Nemours Powder Co., Owner.)

LEATHER

— THAT DON'T CRACK —

That can't be distinguished from machine buffed hide.

That wears as well as expensive leather but costs much less.

Leather with these advantages is **Diefenthaler's** soft and pliable hides, and we guarantee that no oil will come out.

Made specially for carriage and automobile trimmings.

We will send sample hide for your approval without charge.

JOHN V. DIEFENTHALER

Hamilton, Bruen and McWhorter Sts.
NEWARK, NEW JERSEY

METAL BODY MACHINERY

of PETTINGELL PATENTS forms the largest, if not the entire equipment of most every automobile body plant in the United States. This surely denotes superiority of the Pettingell line. These machines are also extensively used to do first class work in getting out body stock and frame work.

WRITE FOR CATALOGUE



NEW AUTOMATIC POWER HAMMER

Designed and made especially for Aluminum or Metal Body Work; gives plenty of room to form or turn body panels, seats, wide backs, etc. Is designed and built to run at a high rate of speed, and the peculiar construction with springs and belts preserves the bearings, pins and screws from racking or breaking.



IMPROVED METAL ROLLER FORMER.

A solid, substantial machine, all metal, with cut gears. Will make any curve or various irregular curves on Mud Guards, Metal Panels, Seats, Etc.



HAND MOULDING OR BEADING FORMER.

Will form moulding or beading any size or shape, cuts all metals, will fold in wire around edge of metal and turn over flanges, etc. Intended for use in factories and shops where small machines are needed for much of the work that can be done quicker and easier than on large power machines, and also for many shops where they have not power or facilities or do not wish to put in the large, powerful and more expensive machines.



POWER MOULDING OR BEADING FORMER

A big improvement over any machines formerly used for forming, beading or moulding; cutting all metals; turning over flanges or folding in wired edge of metal, or any part of the work, and combines three machines in one. Adjustable every way and quickly changed for any work. Designed and built to handle all kinds of metal, aluminum, sheet steel, copper or tin.

THE PETTINGELL MACHINE CO.
AMESBURY, MASSACHUSETTS

Please mention "The Hub" when you write.

Attention!

FALL IN LINE

With the many who are actively interested in our

CUT LEATHER PROPOSITION

We are positive a trial order will convince you that to advertise High Quality Leather, with us means to fill your order with the best that money can buy. We know that you will be satisfied in every respect. - - - - -

Our figures will be mailed you promptly on receipt of your inquiry.

M. STRAUS & SONS

OFFICE:- 440 Frelinghuysen Ave.,

NEWARK, N. J.

"BLACK VELVET" CUSHION SPRINGS

Manufactured Only by the

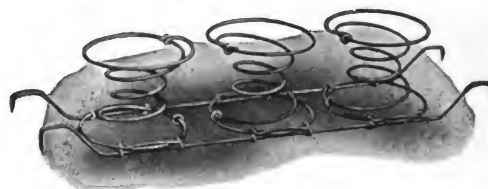
NATIONAL SPRING AND WIRE COMPANY

ALBION, MICH. WINDSOR, ONT.

THE SPRING OF QUALITY.



SPRING or SOFT EDGE CUSHION FRAME
For Buggies or Other Vehicles. Built of the Highest Grade of Steel Wire.



STRIP FOR WOOD OR BOX FRAME



MAYO RADIATORS

have done their part in making the splendid reputations of America's best known cars.

Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
NEW HAVEN, CONN.

Hotel Cumberland NEW YORK CITY

Broadway at
54th Street



**A Real Home
Luxurious
Comfortable**

Absolutely Fireproof

Hardwood floors throughout, covered with genuine oriental rugs, is a feature of the Cumberland which indicates the character of the entire establishment. Rare attention to homelike details eliminates the usual hotel atmosphere. Yet there is retained all the charm of hotel life—provision for every want immediately at hand, and at prices within the limits of the average income.

The Cumberland is within

A few steps of surface cars, elevated and subway. Eight minutes' ride of the best shopping districts. Ten minutes' walk of twenty theatres.

"Broadway" cars from Grand Central Depot pass the door.

Rooms with bath, \$2.50 per day, upwards

Write for Booklet To-day.

HARRY P. STIMSON, Manager

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

FEBRUARY, 1912.

No. 11.

Foreign Motor Body Designing

Striking Exhibits of the Trend of Best Foreign Styles Gathered by
The Hub's English Representative, Mr. Thomas Mattissn, at Olympia.

(Illustrations and Descriptions Concluded in March.)

No. 14 shows a limousine body mounted on Rolls-Royce chassis. The hind body has massive quarters and round corners, the doors are spacious, while the top quarters are will cut up with large side lights. The lines of the front quarter are cabriolied in the controlling and elbow lines. The design calls for a deep quarter and door for comfort, as well as for protection. The hinge quarter is scuttled, which allows the steering column to come close up to the chauffeur's handling, while it is protective against weather as well. The body is fitted with a hinged luggage platform behind. The car is a massive piece of fine motor body work and well designed for touring long distances, while it seems to possess a strong reserve of resistive power and good carriage building engineering.

No. 15 shows a three-quarter cabriolet body with enclosed dash mounted upon a Vauxhall chassis. The lines of the design are thrown to give a massive surface effect, a most difficult thing to hinge to plainness. This body by the lowering of the window, folding of the pillars and folding back of the hood, can be transformed into an entirely open car. The overhanging of the folding hood is reduced to a minimum. This type of body was originated by Messrs. Mulliner about four years ago.

No. 16 shows a three-quarter landaulette body mounted on Napier chassis. This is a plain, level-sided body, and from this quality, demands the highest art to produce effect without the aid of elaboration. The design shows a deep front quarter, the elbow of which lines with the belt line of the body. In this photo one can see a fine sterling piece of motor coach building backed with the talent of a good carriage building engineer. A feature is that the joints of the opening head are arranged between the leather and the cloth lining of the hood and are thus invisible. Messrs. Mulliner are very progressive in the invention of head mechanism.

No. 17 shows a smartly designed coupe-limousine body with enclosed dash "D" front and tool box. The design has cabriolet hind quarters. The surface apportionments are balanced with subtle manipulation, which the law of curvature demands. The belt panel is finished in the painting in sham cane work. This decoration throws up a contrasting relief to the body's surfaces. The designs reviewed maintain the high reputation that Messrs. Mulliner attained in motor carriage manufacture.

Alfred Knight & Co. of Poole, who are progressive motor body builders, showed two fine specimens of their work. No. 18 shows a cabriolet-landaulette, with rounding corners. The body is massive and shorn of the pronounced ornatation of divisional lines which are a prevailing feature with motor body builders.

The car is well adapted for long tours and possesses all the spacious room so necessary. The body has strong, pleasing lines, and is of comfortable impress. It carries in the hind body two on the back seats and two on the folding seats. The half hood is fitted with patent spring mechanism, and is, together with the extension, covered in enamel leather. A special folding glass screen is fitted in front of the chauffeur. The glass frames are in polished walnut and fitted with beveled edge plate glass.

The upholstery is of the West of England motor cloth, and motor hide, and spring mattress seating dressed with hair. The step and protectors are of patent leather and made removable on one edge.

No. 19 shows a very smart design of a boat shaped body. Its rakish cut gives it a quick and telling appearance, which is quite in harmony with the style of what a touring car of this character should be in its speedy movements. The body is plain and level sided. The hind quarter is made with an elbow rise, which is a relief to the sides and depth, and are still further lessened by a belt panel, which in the painting is finished in sham cane work. The body can be half or full canopied.

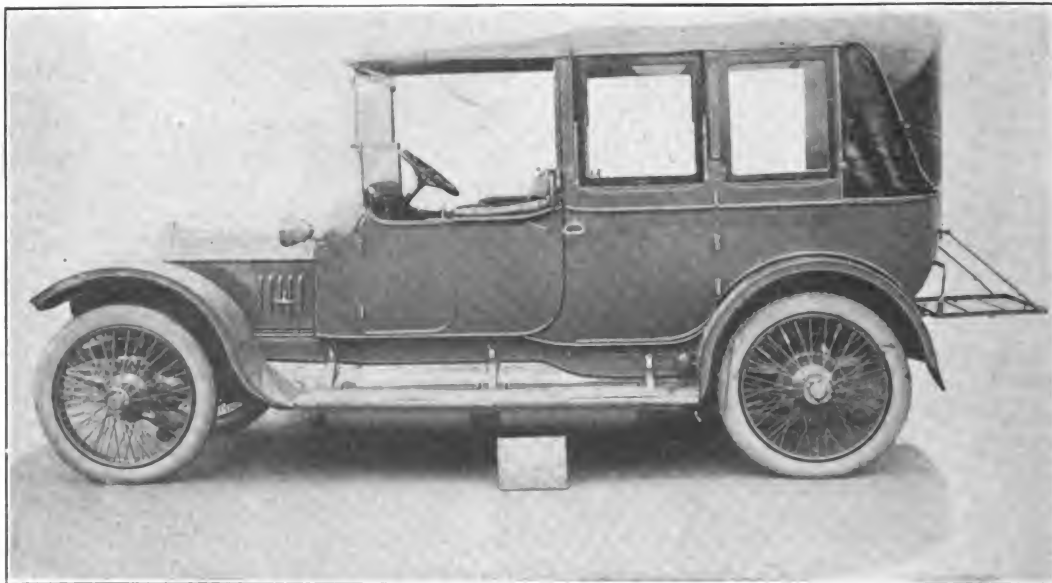
Atkinson & Philipson, of Pilgrim street, Newcastle-on-Tyne, exhibited two light car bodies at the stand of the Stanley Steam Car Co. The above firm was established in 1794, and are carriage builders by royal warrant. The exhibits cater to the ever-increasing buyers of light cars and the bodies they have designed come well up to the ideal of what a light yet roomy body should be, while they have succeeded in giving a stylish smartness to the lines enclosing the narrow spaces at their command.

No. 20 shows a single landaulette with canopy. The car is of light and elegant design, the surfaces being cut up with seasoned judgment in bringing out the essential elements of lightness combined with strength which are enveloped in the telling feature of gracefulness. These characteristics are all present in this body and the builders are to be complimented on the production of one of the lightest cars as well as one of the smartest of its class in the exhibition.

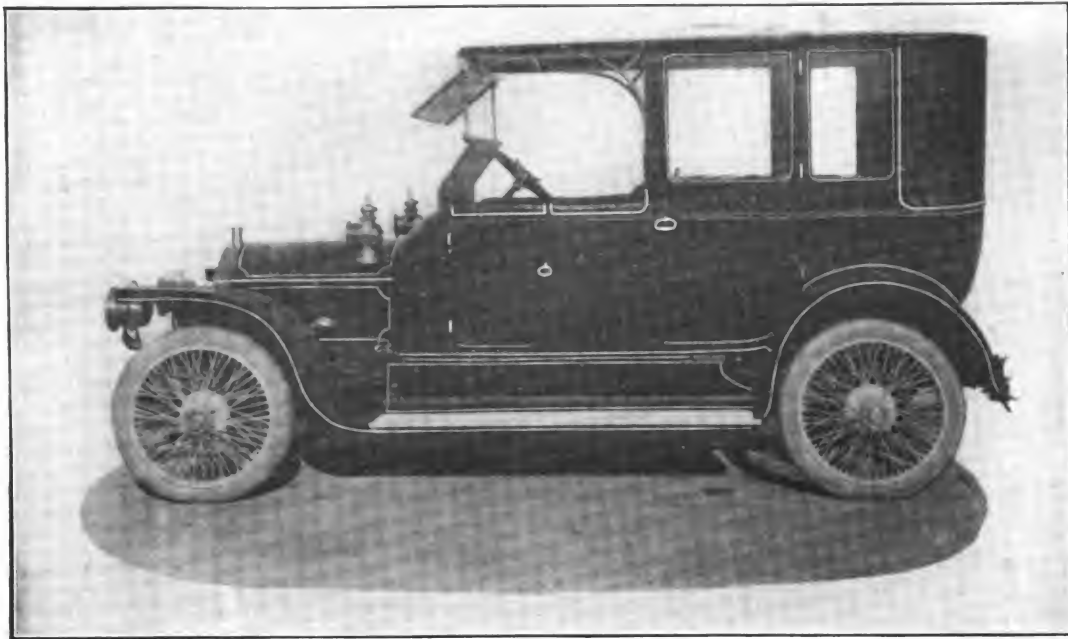
No. 21 shows a newly designed two-seater on cabriolet lines. The quarters are deep, which admit of the doors being deep also, so that there is plenty of room for the chauffeur and other occupants as well. In these little cars the difficulty is to get a graceful swing on the lines and this has been a hard experience to many builders who have devoted their energies to the solution of this artistic and commercial problem. This body goes a long way on the journey to achieve this success. The hind boot has room for a considerable quantity of luggage. The cape hood



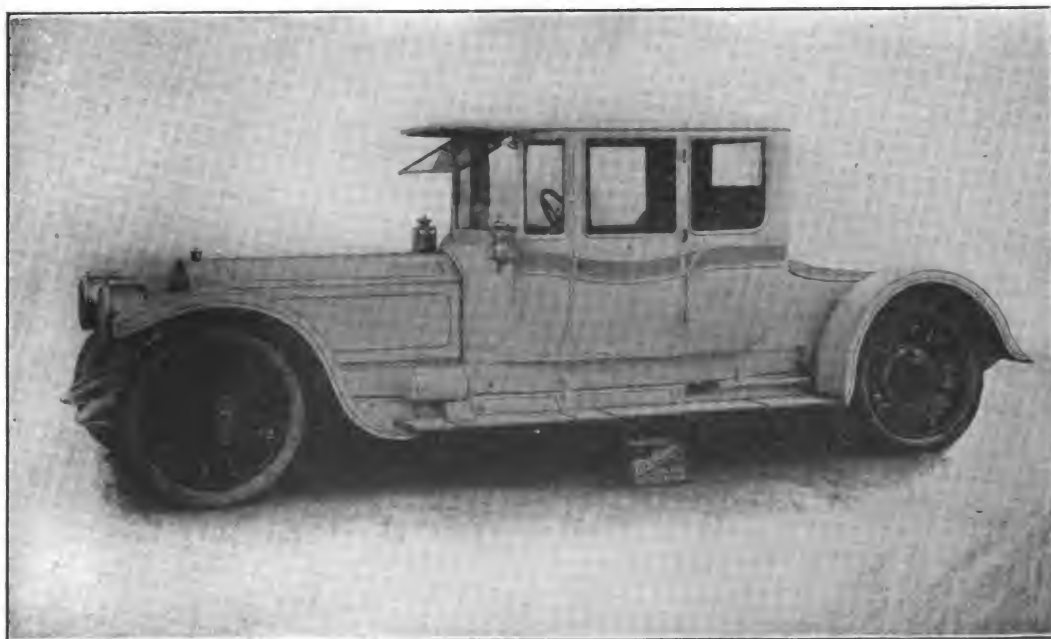
NO. 14—LIMOUSINE.
MESSRS. MULLINER.
London and Northampton, Eng.



NO. 15—THREE-QUARTER CABRIOLET.
MESSRS. MULLINER.
London and Northampton, Eng.



NO. 16—THREE-QUARTER LANDAULETTE.
MESSRS. MULLINER.
London and Northampton, Eng.



NO. 17—COUPE-LIMOUSINE.
MESSRS. MULLINER.
London and Northampton, Eng.



NO. 18—CABRIOLET-LANDAULETTE.

A. KNIGHT & CO.

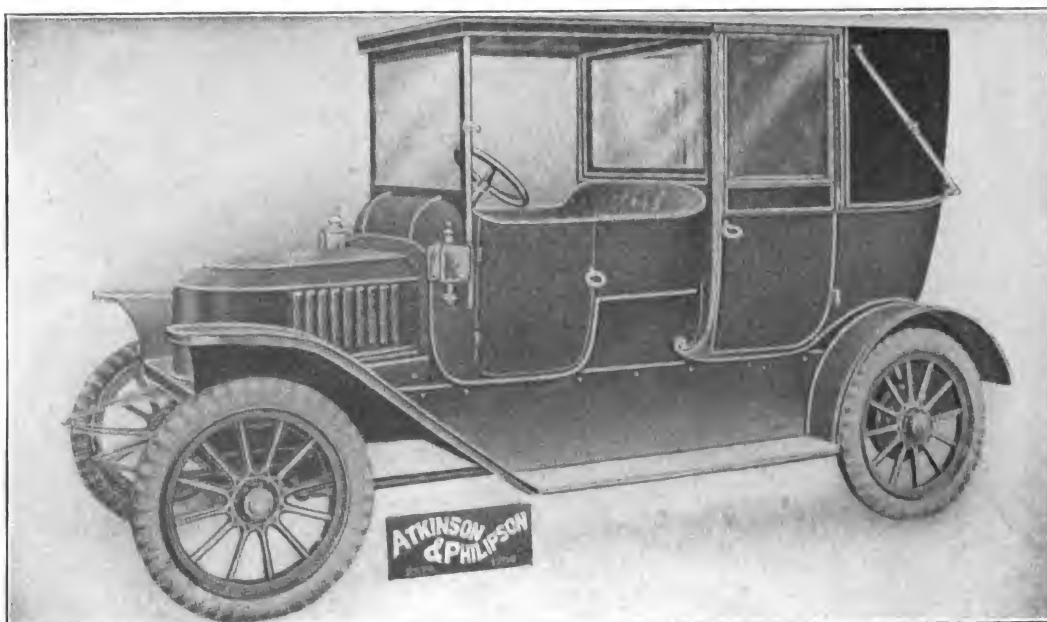
Poole, Eng.



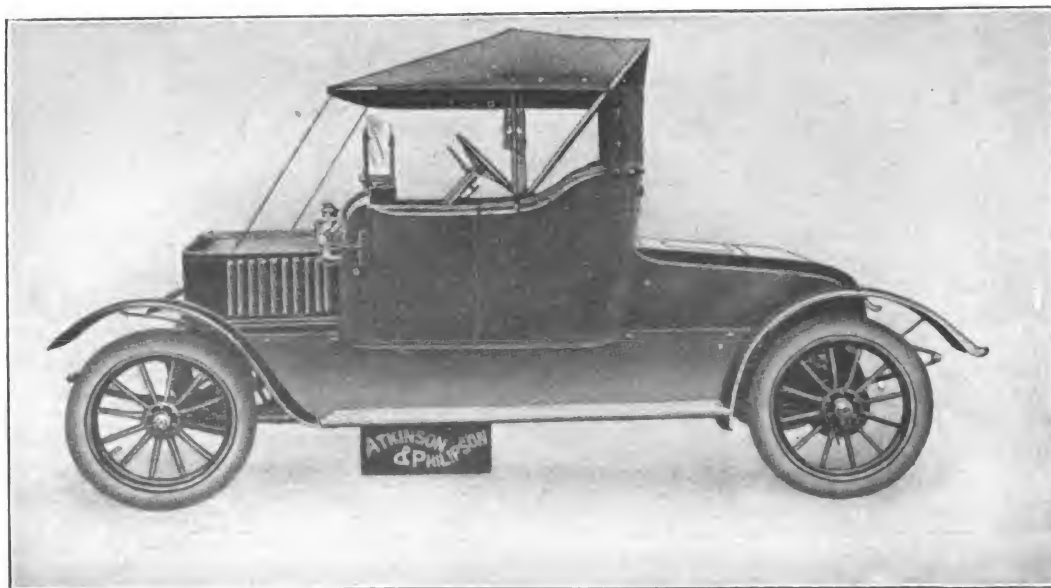
NO. 19—BOAT-BODY TOURING CAR.

A. KNIGHT & CO.

Poole, Eng.



NO. 20—LANDAULETTE.
ATKINSON & PHILIPSON,
Newcastle-on-Tyne, Eng.



NO. 21—CABRIOLET TWO-SEATER.
ATKINSON & PHILIPSON,
Newcastle-on-Tyne, Eng.

is fitted with a new and serviceable type of mechanism. The painting was of a rich brown, with lines of black picking out, and fine lined in leaf gold.

Messrs. Philipson are well known throughout the carriage building world as the authors of technical works on carriage building.

LOUIS RENAULT'S IDEAS.

It is a great error to heed the fashions, as doing so cannot be reconciled with the necessity of having every innovation tried out for months or years by competent technical persons.

My principle has always been the greatest simplicity consistent with greatest durability, and I therefore long ago rejected chain drive, make-and-break ignition, water pumps and automatic regulation of the motor.

It should be the designer's aim to get along with the smallest possible number of parts in the automobile and in each part of the automobile.

I have tried all innovations fully before rejecting them.

I have made very extensive experiments with sleeve valve motors and have reached the conviction that it would be wrong to throw over our excellently proved-out poppet valve system as yet. It is true that the sleeve valve motor by its noiselessness has contributed to advance the art of construction materially, compelling imitation of this feature, but it is false when the silence of the valveless motor is ascribed solely to the abandonment of the poppet valve. The latest types of poppet valve motors which are also justly designated as noiseless prove the correctness of this view.

By the abandonment or improvement of the gearing used for driving the camshaft one of the main sources of noise has been removed. Noise can also be obviated by using an elastic coupling between the armature shaft of the magneto and the motor shaft as for example by the insertion of rubber discs in the coupling. First and last, however—and this is what the valveless motors have taught us—the whole valve mechanism should be encased in the interior of the motor. When the spaces in which valve rods work are filled with grease, it is impossible to hear any noise from the valves. And now, since the designers very generally have adopted these improvements, I am of the opinion that the noiseless poppet valve motor is more practical than the sleeve-valve motor.

I don't believe in building many things into one unit but in placing each organ which may have to be repaired or inspected distinctly and separately; so that, for instance, a chauffeur may be enabled to take the cylinders of his motor down, clean them and put them together again without going to a factory or to a repair shop. I don't think it is possible to do this with a valveless motor in the same simple manner as with the current design. With the latter you can dismount the cylinder together with the valves without changing anything in the adjustments, and the danger is obviated of getting something changed which you can not yourself readjust as it should be.

Furthermore, I don't believe it possible to prevent particles of carbon from the lubricating oil lodging in the motor and causing either more rapid wear or a necessity for more frequent cleaning than in the case of the poppet valve motor.

Just as I have stuck to shaft drive with universal joints, to direct drive and to several other features, uninfluenced by fashion, I feel myself unable to abandon the leather-faced cone clutch. Since 1899 I have used a cone whose apex would be found at about the middle of the transmission box. By this arrangement, which I still consider most practical, the crankshaft is completely relieved of pressures.

While it may be true that the multiple disc clutch is less exposed to wear than the leather cone, I still ask: Which is better, a construction feature requiring no attention whatever for one or two years and then needing only a new leather facing, or a mechanism which demands frequent attention and lasts forever

if it gets it? I prefer a construction with which the chauffeur, if possible, has nothing at all to do so long as the vehicle is in service.

Since the demand for comfort, in addition to reliability and speed, became general, I have experimented a great deal with spring suspensions, and have reached the conclusion that the usual flat leaf springs are altogether satisfactory. But under normal load the springs should be stretched out and not curved, as a stretched spring oscillates more slowly than a curved one and carries the body much more quietly. This is especially of importance for the front springs, because the use of stretched springs there means a minimum longitudinal motion of the front axle. With well designed leaf springs the use of shock absorbers and auxiliary springs is unnecessary.

Though I was among the first, many years ago, to use wire-spoke wheels on my cars, I have not found them as good as wood wheels. The metal wheel is strong only if made by first class specialists, and it cannot be repaired off-hand. Moreover, the wire spokes are subjected to uncertain strains because they stretch and contract much at changes of temperature. The wood wheel is much more yielding and has a certain springiness in itself. Note also that the Paris cabs which formerly were usually equipped with wire wheels have uniformly gone back to wood wheels. The principal reason for this was the trouble experienced in keeping the wire spokes clean. When the vehicles were cleaned with a hose, water got onto the spoke nipples, and it could not, as in the case of wood wheels, simply be wiped off with a rag or waste. In other words, wire wheels demand more work by the chauffeur, which is against my principles.

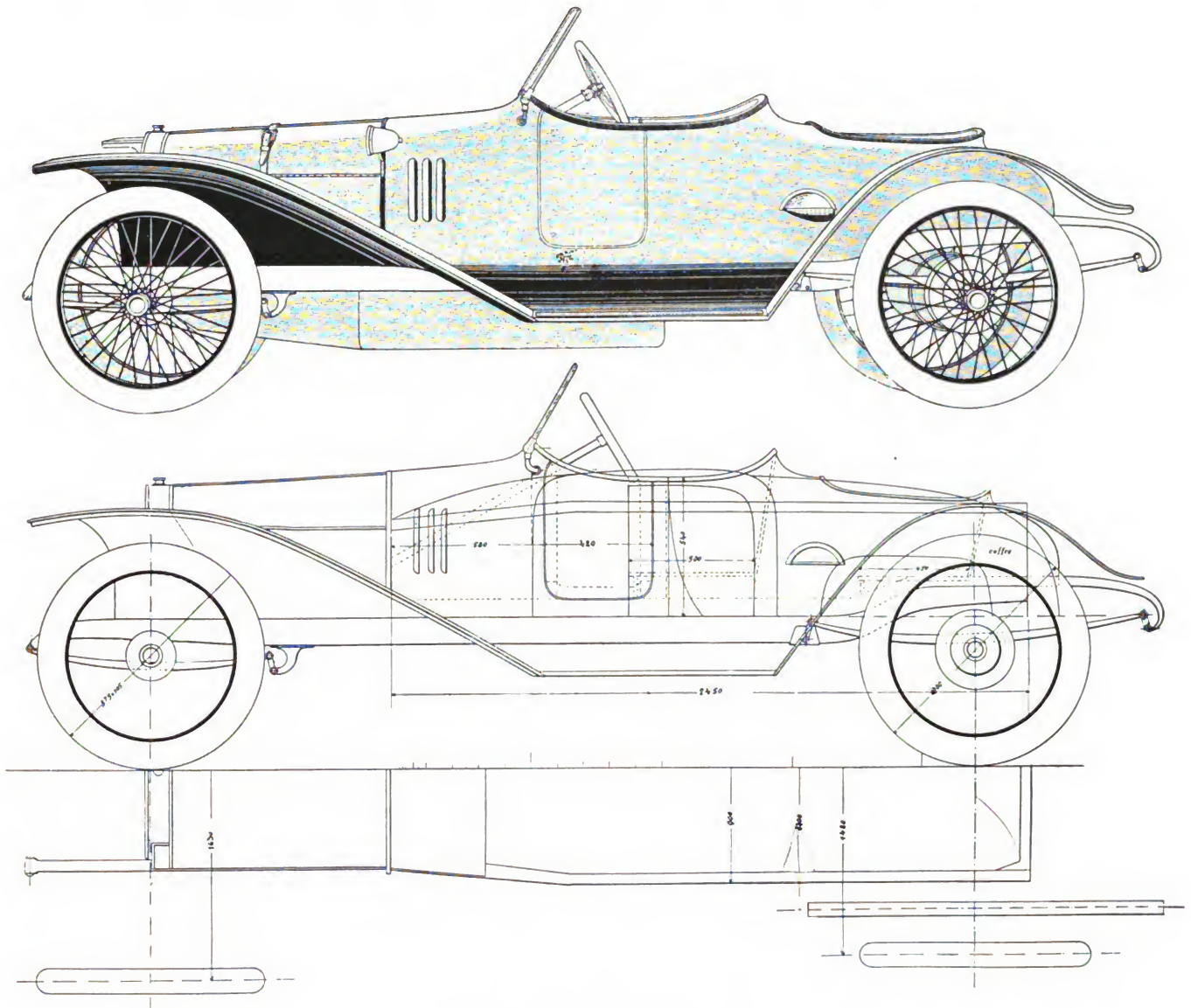
Coming back to the motor, I admit that the fuel efficiency of the slide valve motor is excellent at the maximum of power development. But you cannot run any motor at its maximum without wearing it out much too fast. The average power output must lie far below the maximum, to have reserve power for emergencies as well as for durability. All told, I hold that at the present stage the most advantageous motor to have in one's car is the ordinary type of poppet valve motor with the valves all on one side, all controlled from a single camshaft, the valves all encased and the camshaft driven by noiseless gears or a chain.

With regard to the lubricating system, the generally adopted and much praised force feed circulation of the oil is, in my opinion, wrong. In its circulation the oil is bound to carry along with it minute particles of carbon or detrition material from the cylinders and, however fine-meshed the oil filter is made through which the oil is forced to pass before being used again, it is not possible to avoid some deterioration of the lubricant. Force feed oiling is also irregular; with a new motor and tight bearings a higher pressure is required to force the oil in between the bearing members than later. And in the case of the crankshaft, the amount of play in the bearings depends largely upon the temperature of the shaft. The extra cost of using oil only once in the motor is insignificant, because the oil used in a circulation system must be thrown away, while that used only once in the motor can be very properly used for the transmission box and the rear axle.

The so-called unit or block construction, in which the motor and the transmission gear are housed together, I consider illogical, because it results in a construction unit which is too long and rigid for the flexible vehicle frame. It must be suspended at three points, and the load at these points becomes too strongly localized. Furthermore, I consider it advantageous to combine only such elements as never, or at least only at very rare intervals, will require to be taken apart; for which reason I, for example, have taken the distributor out of the magneto and placed it accessibly at the end of the camshaft.—Allgemeine Automobil-Zeitung.

The Belknap Wagon Works, Grand Rapids, Mich., recently completed a new power plant and during the year will erect a new two-story brick structure 50-80 feet, to replace the old frame building on Front street.

Wood-working and Smithing



TORPEDO TYPE BODY.

We draw liberally on that excellent new publication, *Le Carrosserie Automobile* for two very pleasing styles of bodies.

Torpedo Type Body. (Illustrated above.)

This illustration from the same source is shown to make plain how attractive a homely type of body may become by the application of taste in design. There is an absence of ugliness, yet all the points wanted by speed enthusiasts are to be found combined with sightliness of construction.

There are places for three passengers, one in the rear, but the rear seat can be made to disappear. Wood is suggested for the interior trim.

Two-Door Inside Drive. (Illustrated on following page.)

There is no pretense at novelty in the single side door two-passenger enclosed body with inside drive, but the idea is to get away from exaggerated types and reduce weight as much as is consistent. This carriage is very light in construction, due to a very sparing use of wood for interior decoration, for one thing. Steel is used as generously as possible in the body. The inside

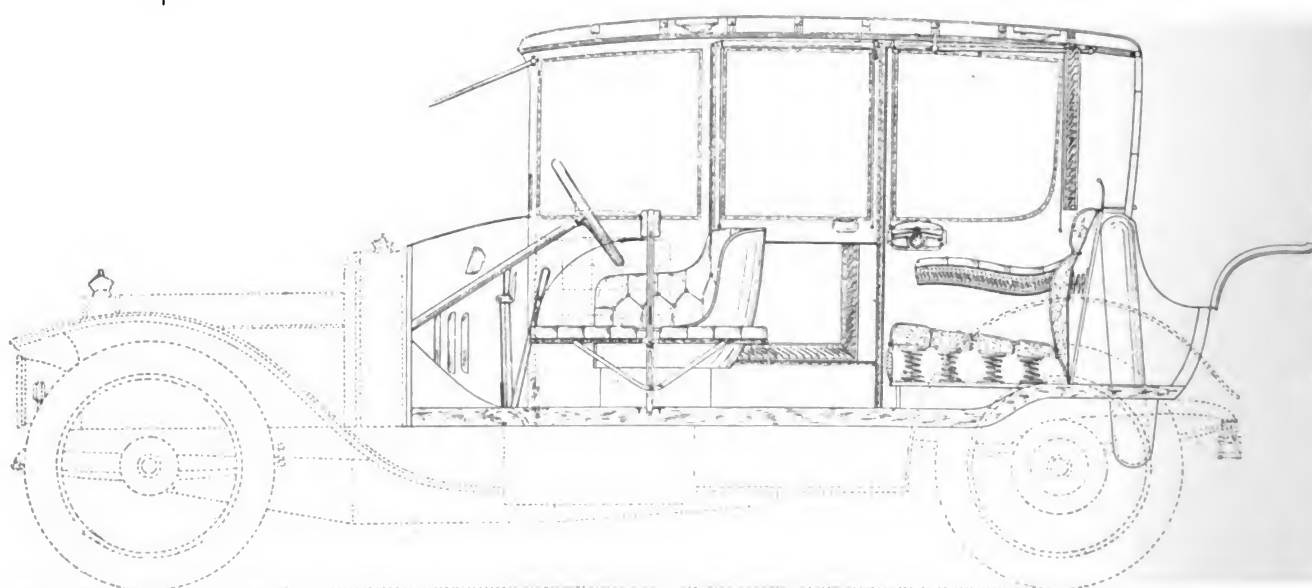
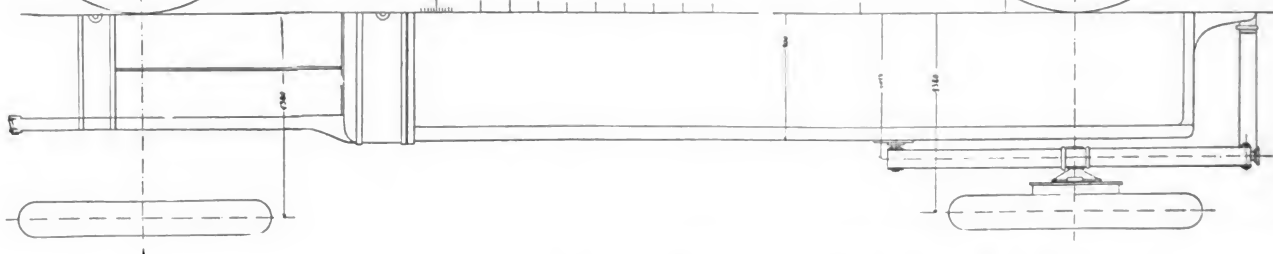
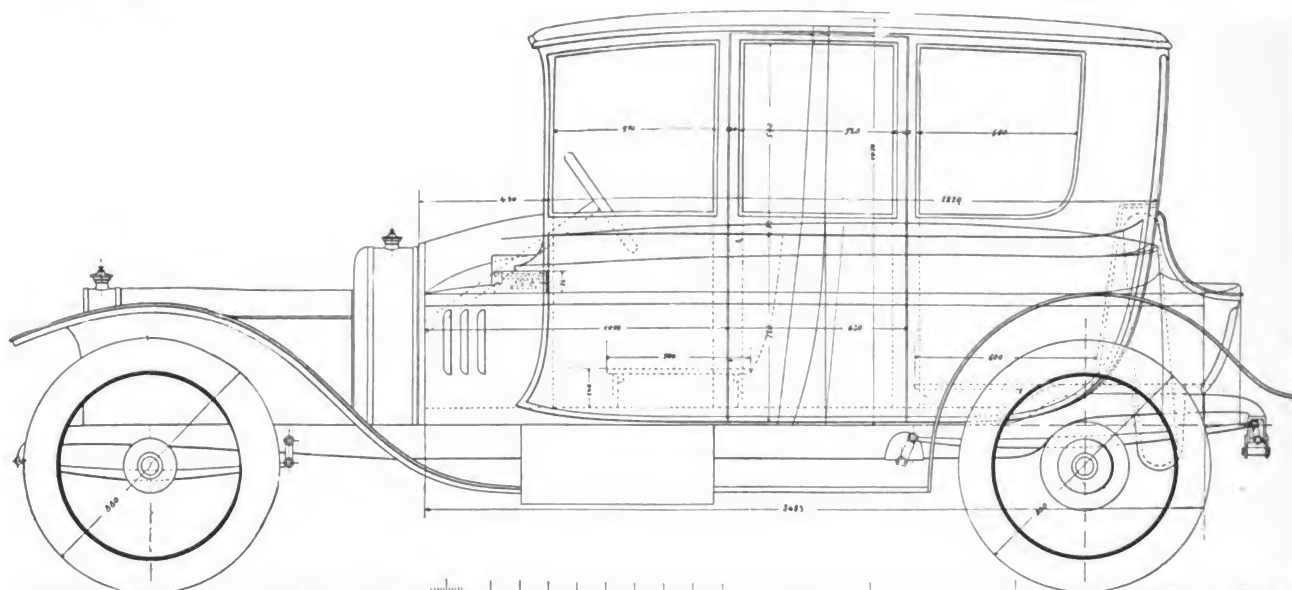
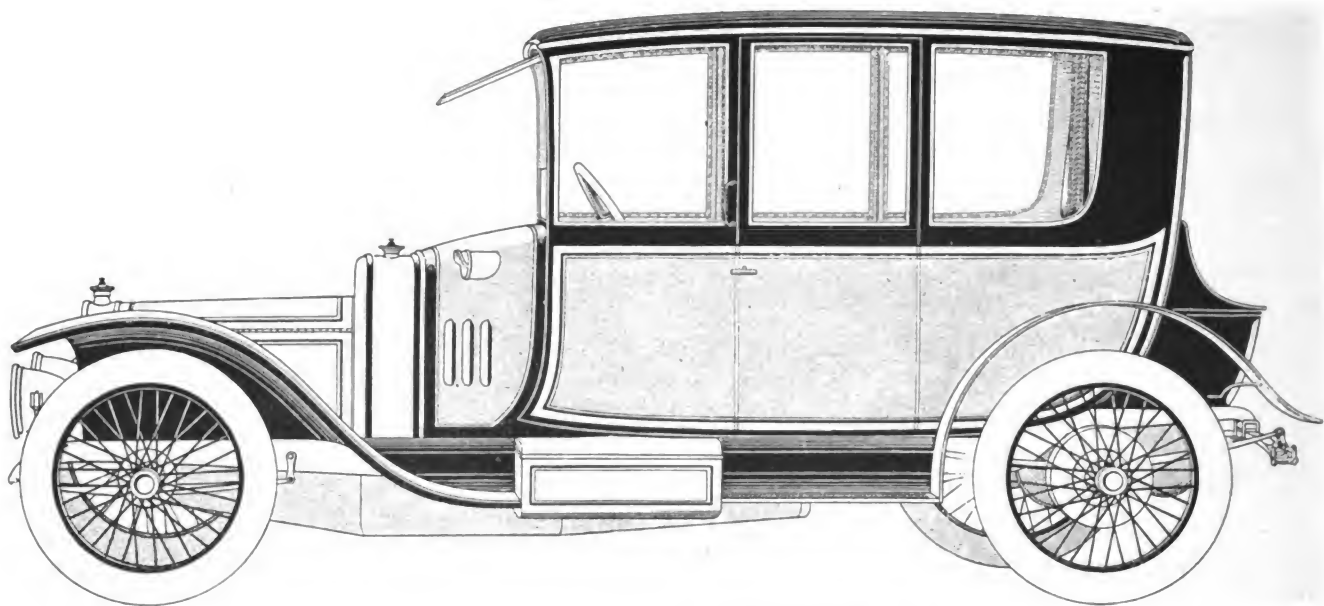
draft showing arrangement of plans for five passengers and the plan of trimming is shown in the second illustration, also the well for spare tire, tools, etc.

The third illustration is a skeletonized working draft with some of the principal dimensions given in the metric scale.

Working draft blue-prints of both the vehicles shown may be had by request at a very moderate price. The office of the publication may be addressed as follows: *Le Carrosserie Automobile*, 5 Passage d'Orleans, Neuilly-sur-Seine, France.

METAL IN COACHWORK.

A most striking departure from orthodox coachbuilding, and one which is attributable no doubt to the motor engineer, is the use of metals for panel work in car bodies, according to *Cooper's Vehicle Journal*. When we give the engineer credit for the introduction of this material, new to the coach trade, we do not forget that, some years before the era of the motor car, experiments were made in this country in the use of sheet metal in building vans and other vehicles. This time, however, was not



TWO-DOOR INSIDE DRIVE.

There is no disposition to discount the immensely valuable work which business economists are doing in the direction of reducing waste. The man who can make a given amount of energy, either human or mechanical, produce more work than it did before, is a great creator, deserving of all the praise that tongues can utter. The development of the best results from given materials and under stated conditions is a task to which the business thinker can contribute much, and the successful solution of which is an achievement decidedly worth while.

The point to be made is that operation should not be done away with simply because they seem superfluous, unless it can be shown that the work itself will not suffer by reason of their absence. The cost of operation may be ever so heavy, and yet it might be penny wisdom to reduce this, if it is going to show in the final result and therefore in the selling price, which must contain the cost of production, selling expense and profit. In order to get a price which will cover all of these items, you must have the stuff, and to get it you must not slight a single part of the entire operation of manufacture.

The kind principally used are mild steel sheets which are generally known in the trade as black sheets. These are not coated with any non-rusting metal, but are subjected to a process commonly known as pickling, which removes any scale which may have formed in the hot rolling and gives a good surface to the paint. These sheets are greatly liable to rust and some trouble is experienced by painters on this account, therefore, coated sheets are very generally used for the best class work. Coated sheet steel used by body makers is as a rule coated with lead, or with a mixture of lead and tin (the latter being known as *terne* sheets). Sheets covered with pure tin are also used for high class work. These are more expensive, but have the merit of providing a very fine surface for the painter.

These specially prepared sheets are eminently suited for the coachbuilders' purposes. Their introduction has naturally been accompanied by facilities for bending and working these sheets into the desired shapes. There does not seem to be much doubt that in the near future, the great majority will buy their steel already shaped into seats, panels and even complete bodies. Some really excellent models have been produced, and are being turned out in quantities, being stamped instead of shaped by hand. It will be readily understood that there is a great preliminary expense attached to the making of these large castings but, now that the motor trade is large enough to absorb quantities of stock pattern bodies, they can be produced in sufficient numbers to allow of them being sold at prices considerably below the cost of the hand-shaped bodies.

There is no doubt that the commercial motors will soon far outnumber the pleasure cars already in use, and it is reasonable to suppose that the greater sameness of these vehicles will give a greater advantage to the manufacturers of these standardized articles than they enjoy with regard to private cars.

A RUST PREVENTIVE.

To keep iron goods of any kind, and especially those parts of machines which are made of steel or iron, from rusting, take $\frac{1}{2}$ ounce of powdered camphor, and melt it before the fire in 1 lb. of good lard. To give it a dark color, add as much fine black lead as is necessary to produce the desired effect. Clean the iron work, and smear it over with this preparation. After this it should be allowed to remain untouched for 24 hours, when the grease should be removed by wiping the ironwork with a soft cloth.

GOOD WHEELS, GOOD CALENDAR.

Hoopes Brothers & Darlington, West Chester, Pa., keep users in mind of the best class of wheels for automobile and other vehicle users by a fine calendar.

then ripe for this innovation. Metal was found to possess certain disadvantages, and public opinion was against it. So the matter never went further than the experimental stage, except in one or two isolated cases where sheet iron or steel was used on vans on their owners' initiative. When the motor car came into more or less general use, however, metal again came to the front, the motor engineers favoring it, and the advent of the *Roi-des-Belges*, and other complicated curves compelled its use, as timber could only be worked to them at great trouble and expense by carving from the solid or by building up. Aluminum was first used for these panels, being particularly suited for them by reason of the ease with which it could be beaten or planished to the requisite curves. The very constitution of aluminum, which so recommended it to the worker, has, however, proved a drawback. It does not withstand rough usage, is easily dented, and has a tendency to crumble and "rot" in the neighborhood of screw holes and other vital parts. These objections have caused builders to abandon its use as far as those panels where sharp bends or double bends are required. Its place has been taken vance in temperature, therefore we have in the air of the dry-kiln, at 170 degrees, a condition that, under free capillary action, even at 50 per cent humidity, will completely dry in one-half the time of dry air at 120 degrees. Aside from this fact, we have a condition of air that is holding more heat to heat the lumber and will supply the heat for evaporation more rapidly, condense the steam more rapidly and prevent the direct radiation from the stock.

The thing to be desired in good kiln building is to have the kiln so that this humidity and temperature may be varied to suit the different varieties, conditions and dimensions of wood. This humidity also has to be considered in drying anything.

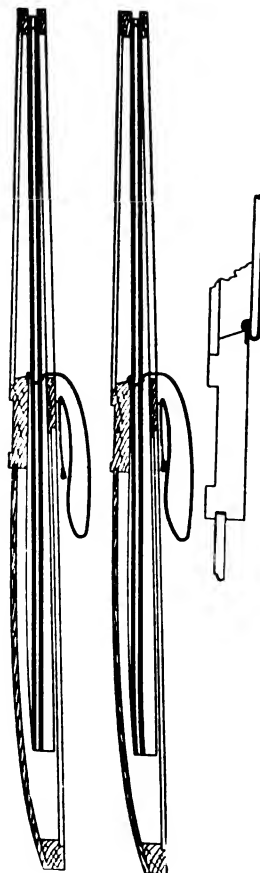
FRAMELESS WINDOWS.

There are patented articles of this kind, but the illustrations are without such protection, says the editor of *La Carrosserie Automobile*.

The well in the door is U-shape and made from copper. It extends the height of the door frame as far as the glass operates. Fastened top or bottom as preferred. The metal is covered with leather, cloth or any material preferred, as in the usual practice. The window glass runs in these grooves, from top to bottom as clearly seen by reference to the illustration. The copper frame has ductility enough to give slightly to curves. The details of construction show for themselves.

FALSE ECONOMY OF SOME EFFICIENCY.

In view of the high price of labor and materials, there is a tendency on the part of many to insist upon the exercise of the greatest amount of economy it is possible to devise in the use of these. Efficiency gone mad is put to work, and the result is that operating expenses are reduced, but it is sometimes at the expense of the work itself. Handling of materials is cut out wherever it is possible to do this and still get in a general way the same approximate results. Other operations are reduced to their simplest terms, and while it all shows up well on the cost sheets, the results from the standpoint of the ultimate consumer are not always so good.



REMARKS ABOUT TORPEDOES.

The following is the expression of a Englishman who has an eye for beauty:

I am afraid that some of the body designs which have lately been evolved have done nothing towards improving the gracefulness and beauty of our cars. The so-called torpedo body in its best forms is undoubtedly an improvement, aesthetically as well as practically, upon the Roi des Belges model of the earlier days, with its wiggle-waggle curves all over. But some of the developments of the torpedo idea I am afraid can only be characterized as hideous in the extreme.

Writing of the flush-sided—or, as the Americans term them, somewhat clumsily, “fore door”—bodies, reminds me that if you get an advantage by a change in any direction, you are almost certain to strike a disadvantage in another, and the more one goes to extremes the more is this likely to be the case. Now these flush-sided, high side-door bodies are undoubtedly very comfortable in many ways, but I have just struck an objectionable feature. I did not get my first body of this type until last autumn, and then and through the winter the car was most comfortable and very snug. But the weather is warming up, and the other Monday was a bright and sunny day and warm enough to drive without an overcoat, and then the fact was forced upon me that the driver's seat was very warm. What was comfortable and enjoyable in the winter was beginning to become oppressive, and I fancy that when the real hot weather comes, the front seats, at any rate, of cars with bodies of this type will be found to be uncomfortably warm, especially so far as the feet and legs are concerned.

ALCOHOL AS FUEL

Some few years ago the gasoline engine enthusiast was quite hopeful that ere this the American gasoline engine would be transformed into an alcohol engine. In our minds we had pictured the new fuel, which is much less dangerous to handle and practically free from loss by evaporation, leading all other fuels in the use of propelling the hydro-carbon engine. In this we were disappointed principally because up until the present time the price of denatured alcohol is entirely prohibitive. Gasoline at 12 to 15 cents per gallon is much cheaper and supplies more power for the money expended than could be gotten from alcohol.

The tests made with alcohol as a fuel reveal many advantages that it has over gasoline and the one disadvantage of price prevents its use. There is little question in the minds of those who have made tests, and who have experimented with alcohol, that with the price equal with gasoline, it would become the fuel for the present gasoline engine as fast as such mechanical changes as are necessary could be made.

In addition to the external advantages above named, that is, loss by evaporation, and safety from fire and explosion, alcohol has some internal advantages which are of special importance. The charges are burnt up clean, leaving the valves and interior of the cylinder free from carbon deposit which has been so annoying to gasoline engine operators in the past. This item alone, other things being equal, would be amply sufficient to extend a special favor to the use of alcohol. But almost every experimenter reports the notation of a smoother and quieter running engine on alcohol than on gasoline. It is also noticed that the engine delivers more power running at the same speed when alcohol is used for fuel.

What operators and manufacturers are especially interested in is, what changes, if any, are necessary in construction of a gasoline engine to make it suitable for the use of alcohol. It was originally thought necessary to heat the air inhaled by the engine so as to insure better vaporization of the alcohol; and there are yet quite a few who advocate some means of heating the air before it enters the cylinder. Experiments along this line have not indicated that such an arrangement is necessary. After the en-

gine is started and run for a minute or two on gasoline and the cylinder walls become well heated, it retains enough heat in the igniting chamber to thoroughly vaporize the alcohol, and after starting the engine on gasoline nothing further is necessary along this line. The regular gasoline carburetor is used. To start the engine, direct on alcohol, when entirely cooled off, heating the cylinder to from 80 to 100 degrees Fahrenheit has the desired effect and at this temperature of the air the engine will start off readily even with the surrounding temperature at the freezing point. After a run the engine could be shut down for an hour or two, and to all appearances cool off entirely, and yet it would start off readily on alcohol, showing that the interior of the cylinder retained a temperature sufficiently high to vaporize the alcohol.

In preparing engines for exclusive use of alcohol, the only change made from the regular gasoline construction is lengthening of the connecting rod so as to drive the piston further up into the cylinder and thus reducing the compression space and correspondingly increasing the compression pressure. For gasoline engines were constructed to reach a compression pressure of about 65 pounds; for alcohol the compression pressure is 125 pounds.

The average gasoline engine can be converted into an alcohol engine by simply increasing the compression pressure to more than double that ordinarily used for gasoline.

The fuel consumption decreases as the compression pressure increases up to about 180 pounds.

The power output to the gallon of alcohol is much greater when the compression pressure is high than when it is as low as that employed for gasoline, and alcohol will be almost an ideal fuel compared with gasoline when the price once reaches a point equal to the present price of gasoline or lower.

It has been predicted for several years that sooner or later the supply of gasoline must necessarily become limited, and therefore inadequate to the demand. But when we consider the wide distribution of the various materials and products from which alcohol can be made, and that these products are nearly all agricultural or vegetable, and that the soil throughout the wide world is fit to produce these vegetable products, we can readily see that the alcohol supply may be considered practically inexhaustible.

A NEW RUBBER TIRE.

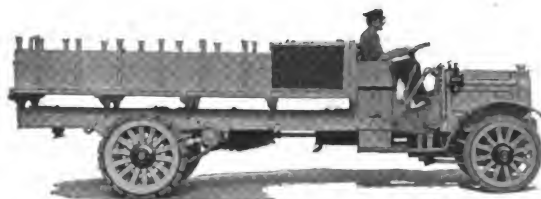
A report coming from England states that a new tire is about to be placed on the market. It is said that it will give 25 per cent more service than any other make manufactured at the present time, and that the tire can be produced and sold for 40 per cent less than anything manufactured heretofore.

The ingredients of this new tire are still a profound secret, but it is known that rubber is the base, and that scrap leather ground to a fine powder and mixed with the rubber and other unknown materials under an extremely high pressure are used in its manufacture. The claim is made that it is equally as resilient as the usual type of tire of to-day, and that in one respect it is even more so for the reason that it can be used with lower air pressure in the inner tube without resultant damage to the casing. Tests made on the famous Brooklands track near London, covering several thousand miles, show that a car is quite as fast equipped with these tires as with the regular pneumatic. Tests have been conducted for the past two years and the only point at which the makers do not claim superiority is with reference to skidding, and on this point they claim there is absolutely no difference between it and the usual type of tire.

It is rumored that a factory for its manufacture will be erected at Racine, Wis., in the near future.

The Stoughton (Wis.) Wagon Company has installed a two-hundred horsepower addition to the power plant. The additional power is in the form of electricity, motor driven machines being used.

1912 Commercial 1912 MOTOR TRUCKS



A Special Department of New Styles in Motor Propelled Business Wagons—The Modern System of Delivery Illustrated.

Continued from February Hub.

VEERAC Standard Express

VEERAC MOTOR CO.
Anoka, Minn.

CAPACITY—1,500 lbs.
PRICE—\$850.



CYLINDERS—2, opposed. two cycle.
H. P.—20.
COOLING—Air.
IGNITION—Battery.
WHEELBASE—82 in.
TIRES—Solid. pneumatic extra.
SPRINGS—Front, three-quarter elliptic; rear, full elliptic.
AXLES—Front, solid trussed.
GEAR SET—Planetary.
SPEED—15-18 m.p.h.
DRIVE—Chain.
BRAKES—Internal expanding.

VEERAC Standard Stake

VEERAC MOTOR CO.
Anoka, Minn.

CAPACITY—1,500 lbs.
PRICE—\$875.



CYLINDERS—2, opposed. two cycle.
H. P.—20.
COOLING—Air.
IGNITION—Battery.
WHEELBASE—82 in.
TIRES—Solid. pneumatic extra.
SPRINGS—Front, three-quarter elliptic; rear, full elliptic.
AXLES—Front, solid trussed.
GEAR SET—Planetary.
SPEED—15-18 m.p.h.
DRIVE—Chain.
BRAKES—Internal expanding.

VEERAC Full Panel

VEERAC MOTOR CO.
Anoka, Minn.

CAPACITY—1,500 lbs.
PRICE—\$950.



CYLINDERS—2, opposed. two cycle.
H. P.—20.
COOLING—Air.
IGNITION—Battery.
WHEELBASE—82 in.
TIRES—Solid. pneumatic extra.
SPRINGS—Front, three-quarter elliptic; rear, full elliptic.
AXLES—Front, solid trussed.
GEAR SET—Planetary.
SPEED—15-18 m.p.h.
DRIVE—Chain.
BRAKES—Internal expanding.

WARREN 1,000-lb.

WARREN MOTOR CAR CO.
Detroit, Mich.

CAPACITY—1,000 lbs.
PRICE—\$1,350.
CYLINDERS—4-4x4½, enbloc.
H. P.—30.



COOLING—Water, pump.
IGNITION—Double. Bosch Magneto.
CARBURETOR—Float feed.
WHEELBASE—110 in.
TIRES—32x4 in.
SPRINGS—Front, semi elliptic; rear, three-quarter elliptic.
AXLES—Front, I-beam; rear, semi-floating.
CLUTCH—Cone.
GEAR SET—Sliding selective.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.
BRAKES—2 sets, internal and external.
BEARINGS—Ball and roller.

CASS

1-ton

CASS MOTOR TRUCK CO.
Port Huron, Mich.

CAPACITY—1 ton.
PRICE—Chassis, \$1850.
CYLINDERS—4-4x4½, en bloc.
H. P.—25.6.



COOLING—Water.
IGNITION—Bosch magneto.
CARBURETOR—Kingston.
WHEELBASE—122 or 129 in.
TIRES—Front, 34x3½; rear, 34x4.
SPRINGS—Front, semi elliptic; rear, platform.
AXLES—Front 2¼x1½, rear 2 in sq.
CLUTCH—Cone.
GEAR SET—Sliding.
SPEEDS—2 forward and reverse.
DRIVE—Shaft.
BRAKES—Contracting and expanding
BEARINGS—Timken roller.

CASS

2-ton

CASS MOTOR TRUCK CO.
Port Huron, Mich.

CAPACITY—2 tons.
PRICE—Chassis, \$2,700; com. \$2,950.
CYLINDERS—4-4¼x5, en bloc.
H. P.—29.



COOLING—Water.
IGNITION—Bosch magneto.
CARBURETOR—Kingston.
WHEELBASE—130 to 154 in.
TIRES—Front, 34x3½; rear, 38x3½.
SPRINGS—Front 62x3 in; rear 48x2½.
AXLES—Front 2¼x1½, rear 3¼x2½.
CLUTCH—Disc and cone combination
GEAR SET—Sliding.
SPEEDS—4 forward and reverse.
DRIVE—Shaft and chain.
BRAKES—Two sets.
BEARINGS—Timken roller.

CASS

1-ton

CASS MOTOR TRUCK CO.
Port Huron, Mich.

CAPACITY—1 ton.
PRICE—Chassis, \$1,850.
CYLINDERS—4-4x4½, en bloc.
H. P.—25.6.



COOLING—Water.
IGNITION—Bosch magneto.
CARBURETOR—Kingston.
WHEELBASE—122 or 129 in.
TIRES—Front, 34x3½; rear, 34x4.
SPRINGS—Front, semi elliptic; rear, platform.
AXLES—Front 2¼x1½, rear 2 in sq.
CLUTCH—Cone.
GEAR SET—Sliding.
SPEEDS—2 forward and reverse.
DRIVE—Shaft.
BRAKES—Contracting and expanding
BEARINGS—Timken roller.

CRAWFORD

Open Body

CRAWFORD AUTOMOBILE CO.
Hagerstown, Md.

CAPACITY—1,200 lb.
PRICE—\$1,250.



CYLINDERS—4-4¼x4½, pairs.
H. P.—30.
COOLING—Water.
IGNITION—Double, Remy magneto.
CARBURETOR—Float feed.
WHEELBASE—112 in.
TIRES—34x3½ in.
SPRINGS—Front, semi-elliptic; rear, full elliptic.
AXLES—Rear, full floating.
CLUTCH—Cone.
GEAR SET—Sliding.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.

CRAWFORD

Closed Body

CRAWFORD AUTOMOBILE CO.
Hagerstown, Md.

CAPACITY—1,200 lb.
PRICE—\$1,300.



CYLINDERS—4-4¼x4½, pairs.
H. P.—30.
COOLING—Water.
IGNITION—Double, Remy magneto.
CARBURETOR—Float feed.
WHEELBASE—112 in.
TIRES—34x3½ in.
SPRINGS—Front, semi-elliptic; rear, full elliptic.
AXLES—Rear, full floating.
CLUTCH—Cone.
GEAR SET—Sliding.
SPEEDS—3 forward and reverse.
DRIVE—Shaft.

REMINGTON
5-ton, Models A and C

REMINGTON STANDARD MOTOR COMPANY
New York City.

CAPACITY—5 tons.
PRICE—\$5,000.



CYLINDERS—4-4 7-8x6 in., pairs.
COOLING—Water, pump.
IGNITION—Magneto, high tension.
CARBURETOR—Optional.
WHEELBASE—A, 138 or opt; C, 142 in
TIRES—Front, 36x5; rear, 36x5, dual
SPRINGS—Half elliptic front and rear.
CLUTCH—None.
GEAR SET—None.
SPEEDS—All, forward and reverse.
DRIVE—Chain.
BRAKES—Emergency only.
ALSO—7-ton chassis. \$5,500.

KELLY
(Frayser-Miller)

1-ton

KELLY MOTOR TRUCK CO.
Springfield, O.

CAPACITY—1 ton.
PRICE—Chassis, \$2,100.



CYLINDERS—4-4½x5½, singly.
H. P.—30.
COOLING—Blower.
IGNITION—Magneto.
WHEELBASE—120 in.
TIRES—36x3½ and 36x4.
SPRINGS—Half elliptic.
AXLES—I-beam.
CLUTCH—Cone.
GEAR SET—Selective.
SPEEDS—3 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

KELLY
(Frayser-Miller)

2-ton

KELLY MOTOR TRUCK CO.
Springfield, O.

CAPACITY—2 tons.
PRICE—Chassis, \$2,800.



CYLINDERS—4-4½x5½, singly.
H. P.—30.
COOLING—Blower.
IGNITION—Magneto.
CARBURETOR—Breeze.
WHEELBASE—136 in.
TIRES—36x4 and 36x5.
SPRINGS—Half elliptic.
AXLES—I-beam.
CLUTCH—Disc.
GEAR SET—Selective.
SPEEDS—4 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

KELLY
(Frayser-Miller)

3-ton

KELLY MOTOR TRUCK CO.
Springfield, O.

CAPACITY—3 tons.
PRICE—Chassis, \$3,300.



CYLINDERS—4-4½x5½, singly.
H. P.—30.
COOLING—Blower.
IGNITION—Magneto.
CARBURETOR—Breeze.
WHEELBASE—136 in.
TIRES—36x4 and 38x4, dual.
SPRINGS—Half elliptic and platform.
AXLES—I-beam.
CLUTCH—Disc.
GEAR SET—Selective.
SPEEDS—4 forward and reverse.
DRIVE—Chain.
BRAKES—Two sets.
BEARINGS—Roller.

WARD
700-lb.—electric

WARD MOTOR VEHICLE CO.
New York City.

PRICE—\$1,450 complete.
MOTOR—Single, 250% overload capac.



CONTROLLER—Continuous torque.
BATTERY—42 cells, "Ironclad Exide"
MILEAGE CAPACITY—40 miles, 10-12 m.p.h.
TIRES—Solid 30x2, front and rear.
BODY—Any style, 60x37x54 in. high.
LOAD CAPACITY—700 lbs.
SPRINGS—Front, full elliptic; rear, full platform.
BRAKES—Two, contracting.
STEERING—Lever.
DRIVE—Chain.

WARD
1,000-lb.—electric

WARD MOTOR VEHICLE CO.
New York City.

PRICE—\$1,900 complete.
MOTOR—Single, 250% overload capac.



CONTROLLER—Continuous torque.
BATTERY—42 cells, "Ironclad Exide"
MILEAGE CAPACITY—40 miles, 9-11 m.p.h.
TIRES—Solid 32x2½ front and rear.
BODY—Any style 72x42x60 in. high.
LOAD CAPACITY—1,000 lbs.
SPRINGS—Front, full elliptic; rear, full platform.
BRAKES—Two, contracting.
STEERING—Lever.
DRIVE—Chain.

WARD
1,500-lb.—electric

WARD MOTOR VEHICLE CO.
New York City.

PRICE—\$2,500 complete.
MOTOR—Single, 250% overload capac.



CONTROLLER—Continuous torque.
BATTERY—42 cells, "Ironclad Exide"
MILEAGE CAPACITY—40 miles, 8-10 m.p.h.
TIRES—Solid 34x3 front and rear.
BODY—Any style 84x45x64 in. high.
LOAD CAPACITY—1,500 lbs.
SPRINGS—Front, full elliptic; rear, full platform.
BRAKES—Two, contracting.
STEERING—Lever.
DRIVE—Chain.

The Hub

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President. G. A. TANNER, Secretary and Treasurer.
24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00
AMERICAN HARNESS AND SADDLERY
DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissière, Paris. Subscription price, 15 francs, postpaid.
GERMANY.—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.
ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Our Illustrations of Foreign Body Building.

This month we continue the series of illustrations that have been so generously supplied The Hub through the courtesy and activity of our English correspondent, to whom the photographs were supplied by the most distinguished coachmakers in the United Kingdom. We take the occasion to express our thanks.

This journal has maintained very stoutly that the automobile would always remain in the freakish stage so far as the body was concerned until the coachmaker became seriously interested. We did not think the work was any part of an engineer's job, and we freely scoffed at all his attempts.

The fashions for the automobile in this country have relied for incentive on what was done by those who had the riper experience, and these were to be found in Europe, of course. The few very fine coach body builders in this country, whose skill much antedates the advent of the motor car, have done most excellent work. None other was to be expected from such masters in the art, but the riff-raff turned out trash to make the discriminating feel melancholy. The only solace was that they were probably engineers, so knew not what they did.

The leaven is now working and the improvement in the United States has been most encouraging, but there must still be quite a lot of sprinting to catch up. The fairest criticism is a lack of initiative, due perhaps to a lack of the imaginative quality in designing. Perhaps there is yet another obstacle working still more strangely, and that is the desire of the machine-making motorist to follow his leader, so that a style has only to be introduced by one

having some little authority for all other makers to order the same thing, even to a copy of the faults.

We once asked a very skillful carriage body maker why it was that he turned out the kind of work we saw that he was willing to sign with his name plate, as he was a man of known taste in design, and he merely shrugged his shoulders and said it was what they wanted and were willing to pay for. That is symptomatic in this fine and progressive land of ours. The trade-mark is the dollar mark, because art is long and life is short and swift.

But some of the more appreciative are waking up. This is more apt to happen when the first flush of wealth has subsided, and a desire for prestige rises uppermost. We quote from the words of a representative of one of the good motor car builders who has been abroad looking about him. He says the automobile still remains a thing of shreds and patches in outward appearance, showing evidence of the true coachbuilder's art in the body if at all, and painfully lacking in the evidence of the employment of that art in the production of an example of true vehicle architecture. He adds that already the French and German coachmakers, backed by public demand and appreciation, are fast forcing their ideas of consistent designing. We are pleased to humbly agree with him.

The very recent automobile salon exhibit of foreign cars held in the ball room of one of the New York hotels was a very illuminating object lesson of what could be done and the lesson must have borne fruit if the fashionable attendance is something to go by. We think even the most uncultured kind appreciate beauty, even if they are not ready with a reason, and stop at "classy" as a definition, as the length of their tether.

We are glad to be able, through the courtesy of the English coachbuilders, to show what careful designers are doing, and hope we are contributing our share towards better things.

The Diesel Motor.

We have seen it reported that Dr. I. R. Diesel, the inventor of the engine bearing his name, is at work, has been at work since 1908, on a road motor. We learn that at the present time experiments are in hand in collaboration with a French manufacturer of high repute, with a view to turning out a four-cycle Diesel to use crude oil and to function at high speed, yet not heavier than the customary types at present in use in motor cars.

It is said that the slow-speed type is already a success for heavy work such as commercial cars and omnibuses. There is such an omnibus on the Berlin streets.

The new engine will be a radical departure from standard kinds, preserving combustion at constant pressures, which makes for the greatest efficiency, and very sparing in fuel consumption. The design will be entirely new, it is reported.

If the eminent inventor is as happy in his new conception as he has so far been in the Diesel as we know it at present, it ought to record an advance in the art that will be most interesting, perhaps epoch-making.

The economical, simple, cheap, very efficient motor is

not here yet, but it is bound to come, and then we will see some very real steps in advance in the use of the horseless vehicle.

What has so far been accomplished is wonderful, however looked at; so was the invention of Morse in telegraphy, but what a back number the apparatus designed by the distinguished man soon became, when the Edisons and others got busy with duplex and quadruplex systems. Not until then did wire communication amount to much. At present motor practice in cars and trucks amounts to too much—in up-keep expense—and it is a luxury or a plaything for the very well-to-do, whatever other claim may be put forward.

Its present is the promise of a brilliant future, when economy and efficiency will be hand maidens.

Things That Impress Abroad.

The small bore, long stroke idea in motors.

The extending use of the wire wheel.

The way the worm drive is screwing its way to the front.

The wide use of the silent type of chain, especially its use for transmission.

The absence of self-starters.

The high repute of the silent sleeve motor.

The probability that as fine a patent fight is brewing over infringements of the sleeve engine of Knight's design, as we had in our own Selden controversy.

The fine way the foreign coachbuilder is coming into his own in the matter of motor body trade.

The claim of one large French concern that a car a year is produced for less than each one man employed.

The lack of interest in the subject of standardizing of engine and body parts.

The absence of anti-skid chains.

The prevalence of steel-stud tire treads.

That wood wheels are so largely made from oak, ash and cypress, where good second-growth hickory could be imported and used.

The interesting fact that there are fifty automobile shops building bodies, chasses, etc., engaging the services of 3,000 workmen in Belgium.

That owing to the extraordinary painting of taxi bodies for the purpose of attracting custom, the Berlin chief of police has issued an edict that all bodies shall be painted a uniform color—chocolate for the gas engine kind, and ivory for electrics.

Oils.

There has been quite a deal of juggling with oils by paint and varnish makers.

The former old stand-by, linseed, has had to go into partnership with China wood oil, soya bean oil, and fish oil.

Time present it has come to pass that a paint as well as a varnish maker has as many formulae, almost, as there are verses in the Koran, and varnish has become a scientific complexity of the first class in chemistry.

The professors of the testing glass in laboratories are

doing great work. Varnish to-day is a compound that proceeds in confusing ways its wonders to perform. It would be a self-assured, not to say foolish painter, who pretended to know anything about this compound and its mysteries.

In "ye olden tyme" the gum melter and his mixing kettle, with his little set formula that he had evolved by some rule-of-thumb process, was a simple citizen, and we had a pretty good line on his methods. Not so now. A "batch" is mixed now with as many combinations as there are in a new game of solitaire, and the cost is an element that cuts much of a figure in the product.

Some varnish makers will undertake to meet any price and match any competing sample by a juggle with the contents of various tanks, or the additions of various oils, in a way that commands admiration for the ingenuity and skill that is brought into play.

The fish oils have had some strong lines in the play. After much experimentation it seems that a true fish oil like Menhaden gives the highest iodine number, hence is the most reliable. The so-called fish oils like whale, porpoise, etc., are really animal oils, and have been finally put in their proper place.

The Menhaden oil has been found a fine agent in the treatment of enamel leather. The resulting gloss is not so high as when linseed is used, but the leather is more flexible, with an unctuous character that prevents cracking. This makes it fine for vehicle tops. Its defect is a tendency to effloresce, thus giving off a "bloom," but it can easily be removed by rubbing with a cloth moistened in benzine, or a mixture of benzine and turpentine.

Varnish-making is such an interesting puzzle we are surprised that the "experts" who parade through the pages of the trade press with profound reflection current twenty years ago, do not put on "jumpers," get a job in some varnish factory, and learn something of real interest to write about.

The Time Gyroscope.

The gyroscope is that wonderful spinning balance wheel that keeps stability on its even keel no matter what the angle of inclination.

A man of business could apply the gyroscope idea to his methods and fare well. A balance of time given to action and thought is good to employ.

We seem most to admire the fellow who is fussing continually, as if he were using every precious moment without waste. Such a man would feel sheepish if caught stopping a moment to think. His gyroscope is work and it must be kept whirring though it only circles the rim of a bushel and gets nowhere.

The thinking practice is worth while, and would be a great help in many a business, where the only thought seems to be to coin a word like "boost," and to believe the world is being moved by a ceaseless, fussy, personal wiggle, sometimes mistaken for result-producing work.

But, maybe, the thinkers should work more to maintain the balance.

ARREST OF CHAS. H. WALTERS.

Charles H. Walters, general manager of the DeTamble Motor Company, of Anderson, Ind., and former vice-president of the Mansfield (O.) Rubber Co., was arrested at Galion, O., Feb. 7, on charges of larceny and embezzlement, aggregating \$16,654.83. His alleged defalcations may reach \$200,000, covering a period since February, 1911.

The charges lodged against Walters by the indictments include larceny, concealing stolen property, concealing embezzled property and embezzlement. One indictment charges him with stealing \$12,000 worth of 6 per cent first mortgage gold bonds of the DeTambles company given him by Aquilla O. Jones, of Indianapolis, trustee of the DeTambles company, for use as collateral with the Mansfield Rubber Co., as security for an account of the Anderson company, with the Ohio concern, but which they claim they never received.

Later, the indictment declares, Walters turned them over to certain parties who had become indorsers with him on certain paper, and representing that they had been given him for reorganizing the DeTambles company. It is alleged he divided them into three parts, distributing two-thirds among friends and kept \$4,000 of them for himself.

The second indictment charged Walters with the theft of \$3,340 worth of bonus stock, being kept in the vaults of the Mansfield company, subsequent to the formation of a syndicate to float for the company a loan of \$50,000, needed as working capital. Under the arrangement the company was to issue \$75,000 worth of "water," according to the indictment. A syndicate was formed to take up \$50,000 of the amount on notes and, as a reward to various subscribers to the stock, a bonus was to be given each in the shape of a slice of the remaining stock.

All of the bonuses had been paid, it was alleged, with the exception of one stockholder's account, which was being kept until he should call for it. Walters, it is charged, took that stock and refused to return it to the officials of the company. Later he was discharged from the employ of the company.

The third indictment brought against Walters charges that he collected an account due B. L. Chase, then president of the Ohio company, amounting to \$1,314.83, and kept the money. Chase, the indictment declares, had a standing account with the DeTambles company in his own name. Walters told him he would collect it and the indictment charges that the collection was made and the money placed to Walter's account with the Anderson company. He then told Chase that the Anderson company was in financial straits and assured him the money would be paid September 10, 1911. Since that time evasive answers are all that have been received by Chase concerning the sum.

LIGHTING SHOPS.

In speaking of any work room it is a point well made to say the light is good. It is not a matter carefully studied, but it is important. The chief trouble is with the artificial lighting, and it presents some features not always clearly understood.

There is some fog as to the placing of lamps, for instance, high or low. If lamps are designed as they ought to be for a specific purpose, it makes little difference if they are high or low in the measured amount of the light given.

As having regard for the workman's eyes it is better that lamps should be high slung, and if measurements are correct, there will be less shadow cast on the work in hand.

This is explained by an expert in light this way:

Suppose we want to spray a certain number of gallons of water per minute over each square foot of a certain room; suppose, also, for our first example, that we suspend a number of nozzles at regular intervals over the room at a height of four feet, while as a second example, we suspend them at ten feet.

If we hang them four feet high, each nozzle must spray over

a much wider angle than if suspended at ten feet, or if the nozzles are not changed when the height of ten feet is reached, each part of the room will be receiving water from several nozzles. The amount of water falling on the floor will not be changed by the height at which the nozzles are hung; the height only affects the area over which water is being sprayed. In the ordinary case in which lamps equipped with reflectors are hung at regular intervals over a large room, the effect of raising the lamps is simply to increase the area over which the light from one lamp is spread. When the lamps are high, the light from the various lamps overlaps at many points, but the total light is the same.

This overlapping is very desirable, as it tends to eliminate shadows from any one lamp. On the other hand, if the lamps are not equipped with reflectors, and do not give distribution of light mainly downward, raising of lamps causes a larger proportion of the total light to be directed toward the walls and ceilings and hence there is loss by reflection back and forth between walls and ceilings.

CENSUS REPORT ON LEATHER INDUSTRY.

A preliminary statement of the general results of the Thirteenth Census of establishments engaged in the manufacture of leather goods, was issued November 27 by the Bureau of the Census, Department of Commerce and Labor. It relates to pocketbooks, saddlery and harness, trunks and valises, embossed leather, leather garments, chair seats and washers; razor strops and similar articles of leather. The figures are subject to such revision as may be necessary after a further examination of the original reports.

The general summary shows increases in all the items at the census of 1909, as compared with that for 1904.

There were 2,375 establishments engaged in this industry in 1909 and 1,918 in 1904, an increase of 24 per cent.

The capital invested as reported in 1909 was \$69,814,000, a gain of \$18,895,000, or 37 per cent, over \$50,919,000 in 1904. The average capital per establishment was approximately \$29,000 in 1909, and \$27,000 in 1904.

The value of products was \$104,719,000 in 1909, and \$82,121,000 in 1904, an increase of \$22,598,000, or 28 per cent. The average per establishment was approximately \$44,000 in 1909, and \$43,000 in 1904.

The cost of materials used was \$60,027,000 in 1909, as against \$44,435,000 in 1904, an increase of \$15,592,000, or 35 per cent.

The value added by manufacture was \$44,692,000 in 1909, and \$37,686,000 in 1904, an increase of \$7,006,000, or 19 per cent. This item formed 43 per cent. of the total value of products in 1909, and 46 per cent in 1904. The value added by manufacture represents the difference between the cost of materials used and the value of products after the manufacturing processes have been expended upon them. It is the best measure of the relative importance of industries.

The miscellaneous expenses amounted to \$8,295,000 in 1909, and \$6,548,000 in 1904, an increase of \$1,477,000, or 27 per cent.

The salaries and wages amounted to \$24,622,000 in 1909, and \$19,855,000 in 1904, an increase of \$4,767,000, or 24 per cent.

The number of salaried officials and clerks was 6,066 in 1909, and 4,171 in 1904, an increase of 45 per cent; their salaries increased from \$4,148,000, in 1904, to \$6,701,000 in 1909, or 62 per cent.

The average number of wage earners employed during the year was 34,907 in 1909, and 34,189 in 1904, an increase of 2 per cent; their wages increased from \$15,707,000 in 1904, to \$17,921,000 in 1909, or 14 per cent.

ROCHESTER CARRIAGE CO. CATALOGUE.

The No. 5 issue of the Rochester Carriage Co. is not large, but it is comprehensive. The illustrations are small but clear, and the styles are current. The book is light, ranging from top buggies to buckboards and light delivery wagons.

INFLUENCE ON DETAIL OF AUTOMOBILE DEVELOPMENT.

The following are a few of the observations made by President Legros in his address before the Institution of Automobile Engineers in England:

In every class of machinery, no matter how well known it may appear to be, either to those engaged in its manufacture or in its use, there are a number of details of which many of the individuals connected with the construction have usually no knowledge, and of which the user frequently has less; in other words he believes them to be quite different from what they actually are. From the ignorance of the small boy who thinks the boiler of the locomotive is completely filled with works, to that of the fireman who thinks the discoloration of his gauge cocks is due to the analysis of the metal—having heard the word used and believing it to be one of the ingredients in it—there are many other forms of ignorance which have contributed throughout to cause delay in the development and use of every class of machinery, and even at the present time many of these factors are still at work delaying that progress which might take place more rapidly were greater consideration given to the minutiae of machinery.

To examine this subject systematically, we shall find that most detail has its origin in design, but that the design is frequently marred in execution, and that the executed work is subjected to abuse by the user and to wear by the conditions under which it works, and it is from the latter end of the story that the cycle of design must recommence, since it must take account of the possibilities involved in use and abuse, and of the certainties involved by wear and tear. The subject, of course, is one which does not admit of being dealt with in general terms for all classes of detail, but it is one which is easy to illustrate by examples.

To take the first example which comes to hand, that of the steering gear, it is well known that the ordinary Ackerman axle affords a fair compromise for obtaining the intersection of the axis of the front wheels at a point on the axis of the back wheels.

This gear as usually made is fitted with a number of pin joints, all of which are liable to wear, and as wear proceeds the two front wheels of the vehicle when it is traveling in an approximately straight line, which, after all, represents by far the greater portion of the distance it runs, will, whether the steering bar be in front of or behind the front axle, take up positions such that the horizontal diameters of the steering wheels would intersect behind the car. After a certain stage of wear has taken place, it is thought necessary to put the wheels in gauge again, and most mechanics, if left to themselves, would set the wheels properly and truly parallel. At this point we should ask ourselves whether this is the right thing to do; whether making things "exactly right" is after all the proper course to adopt, and whether the present example is not an illustration of a distinct advantage to be gained by making adjustments incorrectly in the first instance. If the limit for error in parallelism, determined by experience based on the wear of tires, is half a degree (or, in the language of the shops, the wheels should not be more than a quarter of an inch out of parallel in a length equal to their diameter), and if, when this error has been reached, it is time to put them right, then why not set them half a degree (or a quarter of an inch) inwards to start with, so that they will start with a negative error no greater than the positive error permissible, and thus double the life will be given to the steering before it becomes necessary to take it up, assuming that want of parallelism is the only reason for the taking up.

Take another case: the bearings of an engine are made and

fitted so that there is no shake or knock when the engine is turned around without the ordinary amount of lubricant. Such an engine will run very stiffly until its bearings have become sufficiently worn to admit of the proper thickness of oil film for supporting the load. Under present conditions, with the limit gauges and more accurate machine tools available, some of these factors are being incorporated in the design, as recorded by the drawings, but there are many factors which still escape and are not recorded, and it is left to the shops to do as their unwritten experience suggests to them may be right. The tendency in the bigger factories is to diminish the amount of responsibility left to the individual worker in respect to the employment of what, for want of a better term, may be called "shop knowledge," and the reason may be found in the fact that whereas in the earlier days of engineering the same man both constructed and repaired, now, under modern conditions of output, the man who constructs is of a quite different class from the one who repairs, and the two classes are rapidly becoming almost out of touch with each other. Consequently that form of shop knowledge which was of such use to the mechanic of some years ago and which enabled him to put through work on the imperfect instructions of not very definite drawings, must to-day be replaced by positive information supplied by the designer and embodied in the detail drawings, figured with limiting dimensions and supplemented by specifications.

Standardization is looked after by committees who formulate very excellent rules which should be followed by the manufacturer, but in many cases there is a want of uniformity in the resulting product which calls for better inspection at the start of operations and for the checking of the gauges to which the work is made.

Again, to take an example, the ordinary pneumatic tire is supposed to be interchangeable, that is to say, the same rim will do for any of the tires made by leading makers. The same pump connection serves for pumping up the inner tube, but will be found that the same uniformity does not apply to the other details which go to make up the complete tire on its rim. Security bolts, for instance, have various threads, causing the expenditure of much bad language on the road. The diameters of covers are not always in agreement with the rims within the usual limits, with the result that a cover may prove too tight on the rim and may give considerable trouble in getting it into place. The checking of any of these dimensions is beyond the ordinary purchaser or consumer, beside being outside his province, and the trouble caused by too great deviation from the standard dimensions is only discovered at a time when it gives great inconvenience. The question again is one of the various limiting dimensions of the rim and of the limits permissible in the cover under normal conditions.

In the wheels of pleasure vehicles ball bearings have been used for some years with increasing success, but their application was delayed through failures, in some cases due to overloading, and in many others through imperfect provision being made in the casing of the bearing against the entry of water and mud. In fact a considerable period of time elapsed before the various causes which contributed to the failure of ball bearings in road wheels were appreciated at their proper values, the several factors of the provision for taking end-thrust, the amount of the permissible radial load, the exclusion of water and dirt, and of uniformity in the quality of the manufactured ball bearings all tending to complicate the commercial solution of the problem. This matter of wheel bearings is essentially one of design, because the ball bearing, when worn, is

in general, beyond repair, so that the question of prolongation of the life of the ball bearings is one which can only be referred back through the repair departments, who effect the renewal, to the designer. The presence of moisture, which has resulted in the failure of ball bearings in the road wheels, has also been found to affect those ball bearings which have been fitted to the crankshafts of some engines, and it has been found that a small amount of water in the lubricating oil will cause a sufficient pitting of the surface of the ball races and of the balls to result in premature failure.

It is in the carburetor that the main problem of advance in the internal combustion engine appears at present to lie. Carburetors have been made giving over fifty ton miles per gallon on ordinary touring cars when running at speeds up to forty miles per hour, and there appears to be no reason why such results should not be easily and regularly obtainable when the carburetor has attained a development as far advanced as that of the high tension magneto. At present the tuning up of the carburetor is still frequently effected by the expensive method of running the car on the road, involving a considerable expenditure of the time of a skilled tester, the wear and tear of the whole machinery of the car, and the wear and tear of the tires, which even if only old tires are used, must be added to the other costs. It is true that on the road the conditions under which the carburetor is working are quite different from those of the testing bench. The forward movement of the car may give increased air pressure at the intake of the carburetor; the vibration of the car may appreciably alter the mean level in the float chamber and the amount of gasoline which flows through the nipple. Usually these matters are adjusted by the tester by varying the size of the orifice in the nipple, but from an examination of the conditions which lead to the necessity for this adjustment it would appear that frequently it is the level in the gasoline chamber which requires adjusting quite as much as does the size of the orifice, and in but few carburetors is any provision made whereby the tester can set the level of the gasoline to the desired height otherwise than by filing down the nipple or adding solder to the float.

In the last few years the question of the reduction of the noise on motor vehicles has been almost entirely dealt with in the engine and gear box, apart from the change from chain drives to live axles. In the gear box noise was found to be produced by errors in the shape of the gear teeth, which caused irregularity in the velocity of the driven shaft accompanied by separation of the driving surfaces at speeds beyond a certain minimum. The improvements in gears have entirely been improvements in detail; the involute form of tooth has been retained and the angle of inclination to the tangent of the path of the point of contact has seldom been varied on the other hand, not only have the cutters been made of greater accuracy than those employed for the construction of other classes of machinery, but methods have been adopted, such as those for developing gears by hobbing, which of themselves produce an approximation to the true form of tooth much more accurate than was obtainable by older methods. Again the distortion of the gear wheels which may occur in cementing and in case-hardening has been more thoroughly appreciated, and precautions have been taken by manufacturers which have resulted in a much smaller error in the finished product. In the back axle a source of noise has remained in the bevel gears, which even though made on developing machines, are liable to the introduction of more error than is the case with spur gears. Machines have already been devised, and some are obtainable, for correcting the errors in spur and other gears by grinding, and should it become necessary to run gearing of light weight transmitting large powers at still higher linear speeds, it may be necessary for manufacturers seriously to consider the subject of grinding the bevel gears as well as the spur gears to the final degree of accuracy required. The back axle difficulty can, of course, be overcome by the use of a properly designed worm gear, and

here again it is detail of design which fully determines the difference between the unsatisfactory and the satisfactory.

In the ordinary touring car there is still one detail which looks as though it should be altered before long, and that is the want of alignment between the propeller shafts and the shafts in the gear box when the car is under its normal load. It would appear that a single modification should be possible by which the whole length of the shaft would be in alignment from the front of the engine to the center of the back axle when under normal load. At present the chief difficulty appears to lie in the lubrication arrangements for the engine. Now the angle of inclination of the shafting, if it be made lineable, is but small, and is in fact much less than that of any of the gradients up which the engine is required to work at full load. If the uniform lubrication of the engine were assured for a larger range of angle, covering the total inclination of the engine to the frame added to that of the maximum gradient to be ascended, this difficulty would disappear. In the case of transmission on commercial vehicles, the chain has been found far from unsatisfactory, especially since it has been possible to obtain chain cases which are at the same time simple and sufficiently oil-tight to ensure the chain running continuously in an oil bath. Under such conditions the chain is more silent, its life is increased to such an extent that the cost of chains as a factor in the running becomes negligible, and chains running in proper oil-tight chain cases can now be guaranteed for a life of over 25,000 miles.

ENTIRELY NEW TYPE OF CAR.

Construction of what is claimed will be the largest enclosed passenger automobile ever built was commenced in Pittsburg, February 3, when the frame was laid for a motor car, which, when completed, will accommodate no fewer than 31 persons. The car is being constructed by L. Glesenkamp, Sons & Company, at 320 Penn avenue.

The new car is being built to the order of James J. Flannery, Jr., and is designed primarily for use as a funeral car. Not only will it accommodate 31 persons, but it will have a compartment for carrying a coffin. Other features will be a modern lavatory, with drinking water and a glass holder.

Water will be drawn from a tank in the ceiling of the casket compartment. A telephone will be placed in the rear compartment to enable the passengers to communicate with the driver.

The car will be upholstered sumptuously in maroon colored leather. The floors are to be covered with lineoleum and maroon colored carpets. The ceiling will be covered with felt to deaden the sound and all cushions and backs will be fitted with cushion springs.

There will be three electric domes in the rear compartment, and two in the casket compartment. The outside body panels will be painted maroon with black mouldings and body striping of carmine.

The dimensions of the car are: From dash to rear of body, 21 ft. 2 in.; length over all, 25 ft. 7 in.; height on the inside, 6 ft. 6 in. clear; width inside at casket compartment, 7 ft. 3 in.; width of door at casket compartment 34 inches.

The car body when built will be carried on a Packard chassis, and propelled by a 75 horsepower Packard motor.

While the new car is termed a funeral car, it may be used for parties of any kind, where it is desirable that a large number of persons be together.

CLEVELAND CLUB ELECTS OFFICERS.

The following officers were elected at the annual meeting of the Vehicle Builders' Club of Cleveland on January 20. President Wm. G. Hoffman; vice-president Henry Schaefer; secretary and treasurer H. C. Walker. The club held its annual banquet at the Hollenden hotel the evening of February 3.

HOW THE WORLD MOVES ITSELF.

The illustrations of how man, animal and vehicle are used the world over to move goods is most interesting. The photographs were taken where the work was being done and harnessmakers, as well as ourselves, are indebted to the courtesy of the Team Owners' Review for the chance to see these un-

common sights. A graphic idea of the various methods in vogue from the system of a New York storage company down to the primitive style of carrying goods still customary in Africa and Mexico, is given, as is the method of transportation used thousands of years ago in China.



CENTRAL AFRICA

This picture was taken near a church mission in Africa and illustrates how the natives of that country move their personal effects rolled in bundles of hides. The load on this man's back was said to be 550 pounds. We should say it was an "overload" for a man.



PORTO RICO.

This animal carries the entire possessions of one of the islander's houses. They are moving from one village to another. This "van" is owned by the family. The father and mother were out of reach when this picture was taken. This method of moving is typical of the island population.

CUBA.

The picture below shows a common type of cart used in the West Indies for the removal of household goods. This picture shows a scene not uncommon in Havana, where the original photograph was taken.



MEXICO.

This method of conveyance illustrates the remarkable load that can be carried by the combined strength of the forehead and the shoulders. It is a customary method of moving in Mexico.



**PERU, S. A.**

Moving day in Callao, under the equator, is no doubt the same troublesome experience to housewives as in Boston or Oshkosh. This little mule team was photographed in front of the Callao cathedral.

PHILIPPINE ISLANDS.

This is the type of moving wagons used to a large extent in Uncle Sam's latest acquisition, the Philippine Islands. The driver is enjoying an interruption in his labor by stopping in the shade for a smoke. The work in that country is not done by the hour.

**ARGENTINE, S. A.**

The Spanish love of ornament is shown in this type of van from Buenos Aires, the most progressive city in South America. A large number of van and storage companies are located there. The harness, in keeping with the rest of the equipment, is elaborately decorated with silver trapping, the outfit costing \$850.00 American money. Three men are in charge of each van.

TURKEY.

The vehicle is peculiar to Turkey and parts of Asia Minor. The roads in those countries are poor and two horses are necessary to handle a two-wheeled vehicle about the size of an American postman's wagon.



JAPAN.

This is an illustration from Nagasaki, a seaport town; but shows the customary method of moving in the land of the Mikado which is rapidly passing out of date. Modern horse-drawn vehicles and gasoline motor trucks are now appearing in all the principal cities of the Flowery Kingdom.

**CHINA.**

American stoves and American chairs loaded on a cart, which has been typical in China for thousands of years, illustrates the peculiarities of the Chinaman. This picture was taken in Shanghai, one of the largest cities of that country, on a well paved road. The locality, dimly visible in the background, is the European quarter of the city.

**CEYLON.**

In the island of Ceylon, the land where good tea is said to grow, this crudely primitive cart is still used very extensively. The wages of these cart runners are incredibly low and they work very faithfully, resting only during the mid-day heat. At that it would scarcely do to import them into this country.

**INDIA.**

This is the provincial ox cart of India. The load represents the household effects of three families, that are being moved to a village for a distance of some fifty miles. This picture was taken in the city of Narsinghpur.



**ENGLAND.**

The traction engine is quite common in Great Britain. It runs with considerable speed, but much slower than motor vans. The good roads of England sustain the enormous weight of this equipment.

GERMANY.

This is a very excellent side view of the typical German moving van. These vans often go from town to town under load, being eventually returned to the owners by a round-about circuit. A complete record is kept of the movement of such vans by the German Furniture Transportation Association, an organization of furniture movers in the German empire.

**ITALY.**

This odd type of van from the Italian peninsula indicates the load a single horse can handle under right conditions. Horses are costly in that country and each one is called upon to haul a heavy load.

UNITED STATES.

The latest method of moving, as exemplified by the Lincoln Storage and Safe Deposit Co., who use electric vans in New York City. Some men claim that this style of equipment will eventually eclipse both horse-drawn and gasoline vehicles for city work in this country.



Something About Costs.

(Extracts from a paper read at a recent convention.)

I have always heard that when a bunch of fellows get together for an evening they have a lot of talks and a lot of papers and a lot of hot air about one thing and another, until by the time there have been two or three sessions of this they think there is nothing but talk in it.

Now, I am supposed to be here to-night to tell you what it costs to do business, but I want to do it in such a way that you will not feel that you have been talked to. I want you to feel that I am standing up in front of you, and that it is you doing the talking, that I am just doing the illustrating of the thoughts that you want to get into your minds.

This cost accounting proposition is one on which you all can agree if you get at it right. There is not any diversity of opinion when once you get to thinking along the same line. So we are here to-night to agree on this proposition of cost accounting.

This proposition of the cost of doing business was figured out at some conventions not long ago, and when they got to figuring it, they concluded it was the greatest problem in the retail business. When you come right down and figure it out there is only one problem in any business, and that is how to get some money out of it. You cannot get any money out of any business unless you get just a little more than the cost of the goods plus the expense. The expense is the bridge that you have to get over first before you commence to make a profit. So, to commence with, we will agree on this proposition, that the whole problem in the retail business is the profit and how to get it.

We can figure out schemes for buying goods, we can figure out schemes for cutting down their expense, but if we do not sell enough volume, or if we do not sell above the cost of doing business, there is no profit. If you regulate your prices upon the basis that you are going to make five per cent for your margin of profit, the fellow across the street is going to figure that he can take five per cent, too, for his margin of profit. In time you have to meet his prices or get out of business and let him go it alone. So it is that associations have been formed to get dealers together and show them that here is something in the game besides merely loading up a man's wagon and sending him home with a lot of stuff merely so he can drive right by a competitor's doors and make him think you are doing business, when you ought to know that you have not made anything on the transaction. You and your competitor must alike realize that there is nothing else to the game worth while but the profit you get out of the business.

Now, I am going to put down a series of figures on this sheet of paper, and I want to tell all of you right now that if there are any skeptics in this audience on this question of what it costs to do business, who do not believe it costs them anything to run the business, if they are not satisfied with any of these figures as I put them down, I want them to fight them.

Now, first we are going to put down interest on the investment at 6 per cent. Now you may say that this should not be put down as cost of doing business, that it is not an expense. I claim that it is.

The next item he must take care of is the rent of his buildings. You may say that the proprietor owns the buildings. What is the difference? If he owns the buildings he could rent them to some other implement dealer and get \$100 a month; and if he could get that much rent then when he is running the business and occupying the buildings the rent that he is losing is just that much expense.

Now then, the proprietor is not going to keep his own books,

he will have to pay out another chunk of money for that, and thereby save five years of his life. When I was going to college my father used to send me off during the vacations, in June, July and August, setting up pumps, gasoline engines, binders and so forth, and I used to think it was utter folly to send a college man out to set up binders and reapers and monkey with pumps and engines. I thought he was foolish. I had an idea that my father did not know anything about the game. I thought that I should not be going out and setting up machines; but I find now that although I do not have to go out and set up any of those machines myself, yet if any of the boys come in and ask me what is the matter with a binder that it does not tie, I know pretty nearly as much as they do about it. If a fellow has any ambition he will not be stopped by any of this junk that you may give him to do but he will look after all those details.

Now the next item I will put down here after this help is depreciation on stock. I will put down for depreciation on fixtures, tools, etc., \$100.00. That is not enough. It should be at least 10 per cent on the \$5,000 fixtures, or \$500, but we will say \$100 for that.

Next, donations. I do not know how you fellows are fixed in Ohio, but up our way we have to give to every Fourth of July celebration and county fair, and once in a while the church needs a new coat of paint, and you cannot charge all those things up to charity, because you are in business. They graft on you, and consequently it is an expense in the business, not a personal expense. But I want to tell you something, when a donation committee comes in to get money you never want to be in your office; if you are in, you are out; and if you are out, you are in.

Next, insurance on stock, not on buildings. You do not have to pay insurance on the buildings, the fellow you pay rent to takes care of that.

Advertising.

Some fellows will say that a man doing business does not need to advertise, everybody knows him. If there is any fellow doing a business and can do it on any less expense for advertising than one-half of one per cent of the sales, he is a snap for somebody to go and take his business from him. But do not attempt to advertise by cutting your prices, or some fellow will come along and do you up on that proposition. He will eat up your profits.

I increase my advertising one-quarter of 1 per cent. on my sales if my sales ran less than they were the year before. I would make it in the early part of the year, a little stronger. It may be that conditions were such that I was not to blame for that falling off, but in any event it is time to commence boosting as soon as you see the falling off.

The next item is dues in associations, trade papers, conventions, etc. Let me tell you right now that I am glad to put double lines under that—dues in associations and trade papers. You cannot get too many of them. They are all good. Let me tell you another thing about that expense; if you do not take a trade paper, if you do not belong to an association, if you will only come to the convention once a year, and stop at the very best hotel, and go out with the after committees at night and enjoy life, and have a good time, if you do not get good out of the convention, then it is because you have not got enough *grav* matter in the back of your head to soak it up when it is presented to you.

When I started out attending conventions five or six years ago I did not know what it cost me to do business. I did not

know anything about local clubs. I thought that my competitor was the meanest fellow on earth, no use of telling me anything else. When the other fellow sold any goods it was like harrowing my heart. I had that kind of an idea. But I began attending the conventions, and let me tell you something, there isn't any man in this bunch that is attending this convention here today but can find some fellow sitting within a few feet of him that is just a little better than he is; and if he is no good himself he wants to get something out of that fellow. If he has got any good in him at all and they brush up together, he will get a little of the other fellow's good and take it home with him.

Most of my success is due to mingling with association workers. I heard a fellow say once that no man is any better than his environment. So if your environment is not what it should be you will have to improve it and bring yourself up to the other fellow's level, even if you have to drag him down a little in so doing. Do not forget that dues to your associations and trade paper subscriptions are the best expenses you have. They really are assets, but you cannot sell them when you come to sell out your business, so we will have to charge them up as expense.

Next, goods stolen or not charged. Some of you fellows say nothing is stolen out of your place. If you can say that, you are lucky, but certainly there may be something that is overlooked.

Next, goods returned and discounted, defective, etc.

I do not suppose there is any question but everybody has some bad debts, even here in Ohio. Put that at one-half of 1 per cent.

Some of you fellows don't have any display windows. They are a mighty good thing. If you cannot have a window display, put your stock out on the sidewalk. You know that goods well displayed are half sold, and goods well bought are half sold. So all you have got to do is to buy them and display them and there will be nothing left to do.

These incidentals are kind of a josh with me. I just use that to fill out this amount and make it come out exactly even, but I will tell you, there will be cigars, there will be some fellows bothering you, and there will be other items that we have not figured on.

Before we pass that one item in regard to displays, let me say, do not forget your county fair. Some of you fellows have a fair in your county, and you want to get after it. If you don't do anything else but take out a display and set it up in good shape, and entertain your farmers, you are conferring a great favor on the secretary of your fair. You are a booster. Every time you get a chance to boost your county, do it; it is a good thing to do.

You fellows are all good at figures, and in order to get at my cost percentage I do not have to get down all the figures like we used to do in school, and make the division. You have the total sales for the year and the total expense for the same time, and divide the expense by the sales and you have the percentage of cost of doing business. So if the sales are \$50,000 and expense \$8,500, this figured out would be 17 per cent as the cost of doing that volume of business. I have been figuring that 17 per cent so long that I am getting to be a crank on it, and I cannot figure anything else. When I get hold of an invoice I figure it out at 17 per cent, and if that does not come out right I add some more to my selling price. But 17 per cent is my regular limit.

If you have capital enough to get the benefit of cash discounts you figure that as extra profit, because you give the man 60 days or more to pay, and you have to have a little capital to take care of your credits. You will find that you are not anything ahead at the end of the year on your cash discounts because the banks will charge you discount on the additional capital that you will need in order to take advantage of the cash discount. You occasionally will have to borrow a little money to tide over some extra demand.

The whole trouble is that you have not got enough confidence

in your proposition. For instance, here is a buggy, rubber tired; it cost you \$82 at the factory. The freight is \$3; total \$85. You sell it for \$100. Your expense of doing business is \$17. Take that from the \$100 and you have \$83, or a loss of \$2. Now then, you begin to realize that there is something in this cost game after all.

You can be a good implement dealer, you can be a good booster in your community; but you cannot do those things unless you know your goods and unless you know you have a good article to offer your trade. If you will put yourself on the other side of the fence and see things and talk from the farmer's standpoint when you are selling goods, you will find no trouble to get into the idea of quality. When you sell an article that has quality you need not argue price. You may have to work a little harder to sell a good article at a fair price, but when you have sold it you have done a service to the buyer and to the community.

BUSINESS IN POLITICS.

The business men of America entered national politics openly in Chicago, and firmly resolved to retire to private life scores of congressmen who, it is declared, have proven renegade to their campaign promises.

In a congress of representatives of hundreds of millions of capital at the Congress Hotel a broad constructive platform was wrought into shape which would completely change the legal requirement surrounding the conduct of large business enterprises, would reverse present federal policies toward business in important matters, and, the men responsible declared, would give a stability and efficiency to the country's business machinery that would usher in an era of sound prosperity never before approached.

Resounding blows were struck at present federal policies toward business in speeches. A. H. Revell denounced present trust prosecutions as "trust busting" acts indulged in merely for the applause of the galleries. He declared hypocrisy to be rampant in politics and agitators to be running amuck merely to ride in to popularity and power on the crest of the agitation. He charged that instead of facing the tariff issue squarely it was being merely tinkered with, so that those who desire tariff reform are not benefited and others are kept in a state of constant apprehension.

George W. Sheldon, president of the congress, asserted that the country's present business laws are so crude that the ideas of the least informed business man in the country, if enacted into law, would do the work better.

E. Allen Frost said that our currency laws, our railroad policies, our laws relative to large business enterprises, are all so hopelessly behind the present conditions in business that they merely act to retard a business development that has been so phenomenal that legal definitions have been left a decade or more behind the times. Production in this country has increased 15 to 25 per cent each year for many years, he said, until now \$100,000,000 worth is produced each year, and the capacities for handling it and distributing it equitably have been kept at a standstill by near-sighted laws and parboiled ideas of politicians.

Planks proposed for the platform include:

A tariff commission similar in powers and function to the Interstate Commerce Commission.

Amendment to the Sherman anti-trust law to protect legitimate relations of business and capital.

Restoration of the American flag in the commerce of the high seas.

Elastic currency for the people—stable, flexible, reconvertible.

Disregard of political lines in supporting men in politics who are faithful to their promises and retiring those who are not.

Reform of the consular service and promotion of foreign commerce.

Carriage and Automobile Painting

THE QUALITIES OF COLORS.

A mere matter of twenty-two hundred years ago Aristotle said: The colors of the rainbow are those which, almost alone, painters cannot make; but green, red and violet are not produced by mixture.

But painters did not get wise to this hint for the longest time, not until 1807, when Young's theory of primary colors was published. But since that time the mossbacks have still not given up the red, yellow and blue theory.

In discussing the subject E. St. John becomes interesting to painters. He writes:

By artificial light red is more conspicuous than yellow. This is because yellow, the brightest of all colors, is such because it reflects more white light than any other color.

The amount of white light in artificial illumination is much less than that in sunlight, so yellow loses in brilliancy after sunset. Red, on the other hand, while not so bright as yellow, is a warmer color, and has a depth and strength in artificial light that yellow lacks.

In mixing colored lights we approach white, and, if the mixed colors are complementary, the result is white. But all mixtures of colored pigments approach black, and if the mixed colors are complementary, and of sufficient strength, the result is black. Thus a strong green and a strong red will yield a dense black.

The five pigment colors, red, yellow, green, blue and white, can be mixed to yield innumerable colors. Black and gray can be mixed from the first three. There is but one color that can not be mixed from the primary colors, a pure purple. Our pure purple comes from the anilines, mauve and magenta. The best purple from pigment colors is a mixture of ultramarine blue and madder pink. Vermilion and cobalt blue yield a muddy or dirty purple. A mixed green to be pure must result from a blue and yellow without reddish cast.

The mixing qualities of colors is important. In tinting reds to salmon pinks a blueish cast is frequently encountered. This may be corrected by adding yellow without a greenish cast. In tinting yellows that show a greenish cast, a little red will correct the yellow, and yellows of a reddish cast are corrected with a little green without an olive cast.

That pigment colors are naturally impure is well illustrated in the tints of blacks. All our pigment blacks have a purplish reddish or greenish cast when tinted into grays, and a corrective color, either blue or reddish yellow, must be added. Chinese or India ink is one exception that always yields fine neutral gray tints even in the thinnest films.

There is no denying the peculiar richness of purple. Little wonder it was the regal color of antiquity. From blue to red the purplish hues are azure, purplish, ultramarine, violet, mauve, dahlia, purple, wine-purple, crimson, magenta, red.

VARNISH DRIES ONLY WHEN HUMIDITY IS RIGHT.

Varnish, filler, etc., dry well only by the right condition of humidity, but that humidity in the drying of varnish means not only a humidity of the vapor of water, but a humidity of the oil or turpentine from the varnish. The thing to be desired is to maintain a continuous slow circulation, within the room, confining what we have termed the "fumes" and allowing the heat to do the work. The only necessity in a room is a fine regulation of temperature and humidity, with such arrangement that the direct rays from the steam pipes be not allowed to reach the stock.

PLENTY OF "TURPS" AND DIDN'T KNOW IT.

There are millions of acres of cut-over land covered with stumps and dead trees and down timber, all of which because of its resinous nature decays very slowly, enduring for years.

The tops, stumps, slabs, and sawdust, dead and down timber from fires and storms furnish one of the great undeveloped resources of the country. From this waste wood and entire output of naval stores, embracing turpentine, rosin, tars, pitch, rosin spirits, and rosin oils, having an annual value of at least \$30,000,000, may be obtained without boxing or turpentine a single tree.

"Our scientists," says Secretary Wilson, "have been doing experimental work, and have collected information which leaves no doubt that wood turpentine can be so refined as to be made to correspond closely with genuine spirits in all those properties by which the suitability of turpentine as a paint and varnish thinner, is judged. Wood turpentine which has been refined so as to free it from heavy oils, can be used in well-ventilated places without serious inconvenience to workmen, and is a suitable paint and varnish material, except possibly for the highest grade varnishes, and it may be employed even for these purposes without detriment to the paint or varnish.

The Secretary caused the interior wood work of the new building of the Bureau of Chemistry to be painted with zinc oxide and linseed oil thinned with wood turpentine, and the workmen were not seriously inconvenienced, or made ill, although the odor was unpleasant. The turpentine behaved well under the brush, and after eighteen months there is no apparent defect in the paint.

Wood turpentine can be recovered from any of the coniferous woods, but the long-leaf yellow pine of the South, the Norway pine of the Central North, and Douglas fir of the Northwest, contain a sufficient resin to justify working them.

As far back as 1841 patents relating to this subject were issued, but the process was not developed until within recent years. The difficulty of supplying the increasing demand for turpentine has increased during the past ten years, owing to the rapid decrease of the supply of live pine timbers suitable for even the most advanced system of turpentine orcharding and has turned the attention of business men and inventors to devising and exploiting apparatus and processes for the recovery of the turpentine from the waste coniferous lumber.

The Secretary referred to the census reports which show that the production of gum spirits of turpentine in this country is on the decline, the 38½ million gallons produced in 1900 being worth \$14,960,235, and the 29 million gallons in the year 1909, bringing \$12,654,000, and stated that according to the best estimates the output of our mills is 16,000,000,000 board feet of southern pine, Douglas fir and western pine; that there is at least half that amount of waste at the mill and in the forest, or approximately 8,000,000 cords of wood available for the recovery of turpentine and resin, the manufacture of paper, etc., from which an average of three gallons per cord may be secured, or nearly as much as the entire output of turpentine in 1909.

The Department has issued a monograph on the distillation of resinous woods, especially the product wood turpentine. Any one interested should ask for Chemistry Bureau Bulletin No. 144.

If a motor does not start readily, due to not getting a rich enough mixture at slow speed of cranking, tie a small bunch of waste with a wire close to the air intake of the carburetor, then prime by saturating the waste with gasoline. The added vapor will make the starting easy.

SENSIBLE TALK FROM A MOTORIST.

We can see no reason why there should not be the best of feeling between horsemen and motorists. There would have been no ill feeling if the advance agents of the motor had not claimed so many superiorities over the horse and predicted the beloved animal's doom; or if the "road hog" and "speed maniac" had not crowded the men, women and children who love the horse and pony off the roads. In our opinion the interests of both are common, especially in the matter of good roads and traffic regulations. All should, therefore, "get together." The latest signs of an awakening to the proper relationship, says Rider and Driver, appear in the advertisements of motor truck makers, who show the emancipation of the horse from drudgery and the hardships of slippery pavements. Mr. Gleeson W. Murphy, vice-president of the General Motor Truck Company, when he arrived in New York recently, said: "We have not relegated the horse to the scrap heap. We believe in the horse, and know that there are cases where his services are necessary, even where we have installed both gasoline and electric trucks. Each of the three fills its purpose, and we are prepared to say so, despite the claims of some manufacturers who will insist that the curtain has been rung down on the horse." We congratulate Mr. Murphy upon his display of good, sound, common sense. If the motor is ever going to put the horse on the scrap heap deeds and not talk will do the trick. Mr. Murphy's admissions indicate more than the usual boasts of manufacturers that he believes the merits of the motor truck are sufficient to promote its adoption without the questionable "boost" of exaggerated claims to its superiority over the rival horse.

MISSISSIPPI VALLEY DEALERS.

E. G. Busch, of Washington, Mo., was unanimously re-elected president of the Mississippi Valley Retail Implement and Vehicle Dealers' Association at the coling meeting held February 1 at the Southern Hotel, St. Louis, Mo. J. A. Munro, of Cuba, Mo., was elected vice-president; W. C. Mangold, Anna, Ill., secretary, and Matt Sproul, Sparta, Ill., treasurer. Robert Seibert, Belleville, Ill., retiring secretary, was elected to the board of directors. Others elected to the board were John T. Williams, of Sullivan, Mo., and L. J. Ringer, Jr., of St. Charles, Mo. The officers are included in the board. The choice of the next meeting place was left to the board of directors, but it was generally stated St. Louis would be selected again.

Resolutions were adopted urging legislation that would regulate freight and express rates. The parcels post was denounced. Resolutions were adopted favoring penny postage, a reduction in first class postage rates and an increase in second class.

NAPHTHALENE IN ROAD TARs.

As a large part of the road work in this country seems destined to be effected by the use of tars in road treatment and construction, a systematic investigation of the effect of various constituents upon the adaptability of tars as road binders is of great importance. The recent circular issued by the United States Department of Agriculture on The Effect of Naphthalene upon the Consistency of Refined Tars is a valuable contribution to the good roads literature.

DURABILITY OF LEATHER.

Recent discoveries of ancient leather have been made which give a remarkable idea of the longevity of this integument, when properly preserved. A small buried tannery was unearthed in Germany and a number of hides were found that had lain in the vats for generations, still in a sufficiently good condition to be finished and used. The great museums of Paris and London contain specimens of leather shoes that are hundreds of years old.

UNDERSHIELDS.

An almost universal source of trouble and annoyance is the undershield, and while, during the last decade, cars as a whole have improved out of all knowledge, the undershield retains all its old faults. In the first place, it is never properly drained; oil and dirt gradually collect in it, and cannot be properly removed without taking the whole thing down. This being a nasty job, is, as a rule, only tackled every six months or so. The whole fault really lies in the lack of proper provision for taking the shield on and off. We are accustomed to jagged edges, bends and kinks, nuts rusted hard in position, and to shift them we have to crawl beneath the car and endure the constant fall of dirt upon our heads while struggling with the refractory nut. And when it does move, the whole bolts moves with it. The presence of the shield prevents one getting a hand up to hold the head of the bolt, and unless it can be jammed with a spanner, it will probably be impossible to proceed without calling in assistance.

But the business of getting the shield down is as nothing to that of getting it up again. It bends, springs, slips, and can hardly ever be fitted single-handed. Why does no one take the trouble to make a decent undershield? It is a fitting that by rights should constantly be taken down, not only for internal, but external cleaning.

CROP VALUES.

The annual report of Secretary Wilson, of the Department of Agriculture, shows that while the total value of all farm products has fallen below the big total of 1910, the value of crops is greater than last year's.

In the discussion of crop production and values the secretary states that the climatic conditions of the early part of the growing season of 1911 were adverse to agriculture throughout the country east of the Rocky Mountains in a degree that exceeds all records. For a period of 60 days, beginning early in May, a series of hot waves of marked severity so early in the season followed one another in rapid succession, and the weather bureau is quoted as declaring that it is probable that during no previous similar period of sixty days has the temperature been so continuously and large above the average over so extensive a region in the last half century. At the same time there was a large deficiency of rainfall that added to the crop damage.

The secretary declares that "while the total value of farm products in 1911 is not so high as in 1910, there is great abundance for all purposes." For the first time in many years the total value of farm products has declined from that of the preceding year. The estimate for 1911 is based on the census items, and is \$8,417,000,000, or \$277,000,000 under the total for 1910. The loss is chargeable to the general classes of animal products and animals sold and slaughtered. Dairy cows are the only farm animals for which increase of price is indicated. Eggs, wool, butter, and poultry have suffered in farm price during the year. In consequence of the decline of prices of farm animals and their products, this group is estimated as having produced a value of \$2,913,000,000 in 1911, or \$321,000,000 below the amount for 1910.

On the other hand, the crops are worth more than those for 1910, the estimate of their farm value being \$5,504,000,000, a gain of \$44,000,000 over 1910. Farm prices of all crops are higher than for 1910 except for cotton, cotton seed and flaxseed, and this general fact, notwithstanding the other general fact that production was low, makes about ten crops of 1911 the most valuable ones of the same kinds that the farms of this country have ever produced.

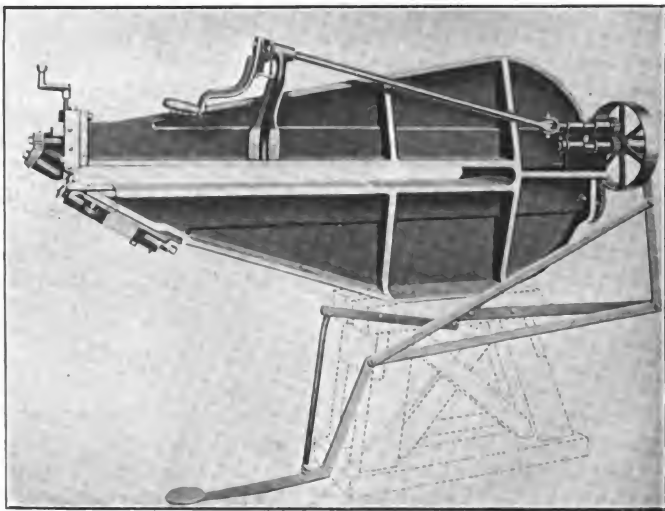
When a remedy is demanded for a slipping belt, the powder known as whiting, sprinkled sparingly on the inside of the belt, is least harmful of any similar application.

ROTARY SHEAR FOR SHEET METAL CUTTING.

There has always been a demand for a machine or method of cutting sheet metal that would not distort the surface, or bend the edges of the metal, and the development of sheet metal work as used in the automobile industry has made this demand pressing for it is absolutely essential that such parts as body panels, fenders, etc., that are finished and varnished, shall be perfectly smooth and true without waves or buckles, however slight, as the varnished surface magnifies many times any imperfection in the surface.

Before the development of the "Quickwork" rotary shear, herewith illustrated, it was practically impossible to cut reverse or serpentine curves in sheet metal without destroying the surface, making it necessary to restore the surface by rolling, hammering, etc., which is not only difficult and costly, but not entirely practical.

Every sheet metal worker is frequently up against the problem of making a number of parts not sufficient in quantity to justify the expense of making blanking dies, but entirely too great to be cut profitably by the use of hand snips, ordinary



"Quickwork" Rotary Shear.

rotary shears or band saws. The "Quickwork" rotary shear fills this gap as its product about equals die work in quality and is 500 per cent cheaper than hand work.

The "Quickwork" rotary shear is now being used by a large number of the leading manufacturers of sheet metal parts for automobiles, ventilation work, steel plate blowers and sheet metal work in general. It is made in a number of sizes and capacities to cut from light gauges up to $\frac{3}{4}$ -inch thick steel. All the different sizes are power driven and all up to 12 gauge capacity have an auxiliary hand drive interchangeable at will instantly with the power drive.

The machines of 16 gauge capacity and lighter will cut reverse curves of $1\frac{1}{2}$ in. radius and greater and will cut holes 3 in. diameter in the center of a sheet of metal without cutting in from the side.

One of these shears will do the work of five men with hand snips or two men with band saws and in addition saves all straightening and smoothing costs, as the metal passes from the shear with an absolutely perfect surface and clean cut edges.

The "Quickwork" rotary shear, also a number of other improved machines and tools for sheet metal workers are manufactured by H. Collier Smith, sole inventor, 125 Harper avenue, Detroit, Mich.

Fire in the wood finishing room of the plant of the Marinette (Wis.) Carriage Works, of which Andrew Heim is proprietor, did total damage estimated at \$30,000.

SUIT AT LAW OF IMPORTANCE TO VEHICLE INTERESTS.

Flandrau & Co., of New York City, have fought and won a case that is important to the trade. The facts leading up to the contention are set forth by Daniel T. Wilson, head of the firm, in a letter which we repeat in its essence:

One, W. B. Manny, sued us for converting to our own use a chassis for which he held a receipt, and he loaned money on this receipt to Archer & Company. He did not notify us, and we knew nothing whatever about the loaning of the money until nine months afterwards.

We delivered the chassis to Archer & Company, to whom we had given the receipt, and who had delivered the car to us. As the chassis was taken by Archer & Company instead of the buyer, whom we did not know, and for whom we thought the receipt was intended, our responsibility ended.

Manny sued us, however, got judgment against us, which we appealed to the Appellate Division of the Supreme Court, and in a celebrated decision handed down a month or so ago, the case was decided in our favor.

The matter was decided for the first case of its kind that came up. The point of the suit is that now, every automobile dealer, body builder or carriage dealer who takes a chassis into his place and issues a receipt, should have the receipt marked "non-negotiable" or he will be liable for the amount of the value of the car. If the person who obtains the receipt raises money upon it, as has been customary on store house receipts, the new law makes the automobile builder, garage, carriage builder or body builder, etc., warehousemen, because their business is not only to repair and build automobiles, but to store for a customer, for charge, automobiles, for which they issue receipt or letter, or any other paper.

This case was decided some time ago. Mr. Wilson has, in his letter, so clearly and comprehensively pointed out the salient points of the decision, along with the circumstances leading up to the suit, that he has made a clearer, briefer and more easily understood synopsis than could be gathered by reading the decision of the court, and for that reason we omit repeating the decision.

NEW AUTO TRUCK FACTORY FOR PITTSBURG.

The H. Lange Wagon Company, Pittsburg, Pa., wagon builders for forty years, have just entered upon the manufacture of automobile trucks in a new concrete factory with an area of 40,000 square feet. The truck manufacturing will be conducted under the name of the Lange Motor Truck Company and will in no manner affect the business of wagon building. A feature of the one and two-ton trucks to be made in the new Lange factory is the fact that an all-Pittsburg product will be made, in this, Pittsburg's first important automobile factory.

The axles and springs are to be made by the Liggett Spring and Axle Company, of Pittsburg, and the frame material by Jones & Laughlin, Ltd. The parts will be finished and assembled by the Lange company and the jackshaft will be of their own construction. All the bolts, set screws, rivets, etc., and all the cold-rolled steel, vanadium products and nickel alloy steel are to be purchased of Pittsburg makers.

The Wells expanding disc clutch is to be used. While this part of the gear is not made in Pittsburg, negotiations are now pending toward having the manufacturers locate a plant in that city. There being no wheel makers in the Pittsburg district the Lange Company will use the Hoopes Bros. & Darlington wheel.

The Lange factory is fireproof and no wood whatever is used in its construction, steel and concrete being the predominating material. All the windows are fitted with metal sash and the glass is of the wire type. The floors are separated by fire doors with fusible links. The floors are of concrete. A large elevator is in the center of the structure and will lift the largest motor trucks. Adjoining the main factory is a double-deck lumber shed wherein lumber used in the bodies of the trucks is seasoned in the natural way. The machine room is a model of its kind and all the machinery is electrically driven.

THE KANSAS CITY MEETING.

C. F. Miller, of Fort Scott, Kas., was elected president of the Western Retail Implement and Vehicle Dealers' Association, which held a three-day convention at Kansas City, January 16-19. H. D. Skinner, of Braymer, Mo., was chosen vice-president, and H. J. Hodge, of Abilene, Kas., was elected secretary and treasurer. The following directors were chosen: W. M. Vickery, Blackwell, Ok.; W. E. Haynes, Emporia, Kas.; E. C. Waldo, Ellis, Kas.; E. C. Hood, Pittsburg, Kas.; J. M. Taylor, Columbus, Mo.; W. T. Osborne, Gallatin, Mo.; P. Westmacott, Hutchinson, Kas., and G. W. Collins, Belleville, Kas.

The dealers declared against the parcels post and for a national good roads law.

Nearly 1,000 exhibits, including every imaginable variety of farm instrument and all the accessories known to the hardware trade, were on display. Convention hall was filled with all that is new in farming.

C. G. Cochrane, president of the association, in his opening address referred to the enormous numbers of failures reported in late years among the retail implement dealers. He said that a year ago 33 per cent of the retail implement dealers of the West failed. This year, he said, only 23 per cent failed. This decrease, he said, was because the dealer was awakening to the fact that he must co-operate with the manufacturer and jobber and reduce his cost of operating if he would be able to withstand the tide. Overstocking, neglect in leaving stock exposed to the weather and improper buying were among the things said to have caused the cry of "no profit" to sweep the implement men out of business. Mr. Cochrane was elected first honorary member of the association in appreciation of the work he has done for the association since its organization.

The executive board will meet March 5 and 6 in Kansas City to choose the place of holding the next convention.

In a resolution to be sent to the Senate of the United States the convention recommended a law for honest advertising—that is, that a dealer shall not advertise goods as being of a quality higher than they actually are.

AUTOMOBILE BOARD OF TRADE ELECTS OFFICERS.

In recognition of his successful leadership of the Automobile Board of Trade during the past year, the manufacturers in that organization, at their annual meeting, re-elected Charles Clifton of the Pierce-Arrow Motor Car Co. to the presidency. All the other officials that served during the past year were unanimously returned to office. Reports of the various committees supplied evidence of the work done for the motor car industry and motor car user, and made apparent the need for a broadening out of the work, plans for which are now under way.

HARDWOOD MANUFACTURERS' CONVENTION.

The Hardwood Manufacturers' Association of the United States held its tenth annual convention at the Sinton Hotel, Cincinnati, the last week of January. Addresses were made by Governor Harmon, Mayor Hunt, and officers of the local clubs. A number of interesting papers pertaining to the timber trade were read. A large amount of business was transacted between buyers and sellers during the week.

P. T. RATHBUN RE-ELECTED SECRETARY.

At a recent meeting of the board of directors of the Tri-State Vehicle and Implement Dealers' Association, it was decided to hold the 1912 convention and exhibit at Cincinnati, O., October 14-19. P. T. Rathbun, of Springfield, O., was re-elected secretary, and Geo. W. Young, of Eminence, Ky., was re-elected treasurer.

IMPLEMENT CLUB ELECTS E. C. HEIDRICH PRESIDENT.

Officers were elected at the annual banquet of the Implement Vehicle and Hardware Club at the Creve Coeur Club, Peoria, Ill., January, 13. Thirty-two members and guests surrounded a banquet table at the Creve Coeur and partook of a sumptuous banquet. Douglas H. Bethard, president of the Association of Commerce, was among the specially invited guests. He delivered a short talk, congratulating the club on the strength of its membership and its progressiveness. J. C. Burnett, of the Hart-Parr Company and Manager Winsted of the Durant Carriage Company were among the club's guests. At the conclusion of the dinner and while the cigars were being smoked the following roster of officers were elected without any opposition: President, F. C. Heidrich; first vice-president, R. T. Huntley; second vice-president, O. T. Eads; treasurer, U. G. Luthy, and secretary, L. N. Sibley. The annual report of the officers shows the organization to be in a splendid condition.

TO CLASSIFY EXHIBITS AT DES MOINES.

At the joint meeting of the official board of the Iowa Implement and Vehicle Dealers' Association and the Manufacturers' Implement and Vehicle Club, of Des Moines, held at Des Moines, it was decided to classify the exhibits at the next convention, and place all exhibits of a kind together. The gasoline engines will be placed on the stage space, where a muffler pipe will be placed in order to do away with the noise. This will be a vast improvement over last year and will do away with lots of confusion that has been noticeable the past two years. The new contracts are ready and applications for space can be made to Secretary Armknecht, Donnellson, Ia. Uniform decorations and signs also were discussed.

PHILADELPHIANS ENTERTAIN.

In place of the regular monthly meeting of the Carriage, Wagon and Motor Vehicle Association of Philadelphia, an entertainment was arranged for the members and invited guests on the evening of January 19, at the Pfaelzer Casino Club house, corner 7th and Girard avenue.

Besides an excellent vaudeville entertainment the members were regaled with excellent refreshments and cigars. Treasurer Frank Schanz acted as master of ceremonies and President Morgey read a brief history of the association. Non-members in the vehicle business were invited to join.

OMAHA CLUB ELECTS OFFICERS.

The Omaha and Council Bluffs Implement and Vehicle Club, comprising jobbers and branch house managers in the two cities, elected the following officers for the ensuing year: President, W. R. Lumry, Parlin & Orendorff Plow Company, Omaha; first vice-president, F. R. Davis, Pioneer Implement Company, Council Bluffs; second vice-president, R. S. Robinson, Henry & Allen, Omaha; treasurer, Olaf Elton, Pioneer Implement Company, Council Bluffs; secretary, F. W. Squires, Omaha.

BOSTON BUILDERS HOLD ANNUAL MEETING.

At the annual meeting of the Boston (Mass.) Carriage and Wagon Builders' Association at the Revere House, January 8th. M. W. Quinlan Jr., Brookline, was elected president for the ensuing year. Following officers were also chosen: Vice-President, Willis K. Russ; secretary, Albert E. Taylor; treasurer, William P. Stone; executive committee, R. E. Harris, A. G. Sargent, A. L. Hatch, D. Harrison, J. A. Kiley, G. M. Bowditch, C. Van Buskirk. J. A. Lowell addressed the members on the meaning and value of the employees' compensation act.

PEORIA CLUB ELECTS OFFICERS.

E. C. Heidrich, Jr., vice-president of the Peoria Cordage Company, was elected president of the Peoria Implement, Vehicle and Hardware Club at the annual meeting, held January 13. Other officers elected were as follows: First vice-president, R. T. Huntley, J. I. Case Threshing Machine Company; second vice-president, O. T. Eads, Acme Harvesting Machine Company; treasurer, G. G. Luthy, Bartholomew Company; secretary, L. N. Sibley, Peoria Drill and Seeder Company; executive committee, W. O. Ireland, E. G. Isch & Co.; H. B. Topping, Kingman Plow Co.; C. A. Patterson, Peoria Drill and Seeder Co.; F. G. Kroenlein, Case & Kroenlein; Charles Wagner, Huber Manufacturing Co.

OKLAHOMAN'S ANNUAL MEET.

The Blacksmiths, Horseshoers and Wagonmakers' association concluded its annual convention in Oklahoma City with the election of officers. C. W. Rutherford, of Oklahoma City, was elected president, John J. Gusack of Muskogee vice-president, and J. P. Nicholson, of Kingfisher, secretary and treasurer. Next year's convention will be held in Muskogee. The executive committee, in addition to the president and vice-president, is composed of T. E. Dewell, El Reno; F. E. Pomeroy, of Bartlesville, and Harry Johnson, of Shawnee.

FIRMAN KAHRS.

Mr. Kahrs died at his home in East Haddam, Conn., January 13 after a protracted illness. He was the editor and motive power of that admirable technical journal named "Glue," and it reflected the force of Mr. Kahr's knowledge as a glue specialist and chemist of the highest rank.

Mr. Kahrs was born in Bergen, Norway, in 1859; had his later education in Leipzig, Germany; came to the United States in 1889 and took up the study of glue at once; made special researches at the University of New York; patented a testing glue pot, which, together with other inventions, were exhibited at the World's Fair, Chicago, 1893, where he received the highest awards.

Mrs. Kahrs, his widow, informs us that "Glue" must be discontinued, which we much regret to learn. We extend to her our respectful sympathy.

MR. KELLNER VISITS US.

Mr. Paul Kellner, coach and automobile builder of Paris, paid The Hub office a very pleasant visit on February 7. He had made a tour of some of the leading cities of the country where he visited many of the large automobile manufacturing plants. He also visited Amesbury, Mass., where he purchased some body building machinery from Pettingell & Co. Mr. Kellner speaks English like a native and says he acquired it in four months' time some years ago in England. Mr. Kellner was particularly well pleased with New York city and had so many dates for luncheons and dinners that his time was fully occupied before sailing. Mr. Kellner had just received notice that he had been elected vice-president of the Paris carriage builders' organization.

FIRE IN STORAGE BUILDING.

The Detroit Forging Company had the experience of a fire recently. The fire was confined to the storage building. The company was in no way hampered in its operations by this fire, which was covered by insurance. The plant consists of separate buildings and the fire did not spread to any of the other structures. The company was able to resume operations the morning after the fire. Mr. H. Scherer is president of the Detroit Forging Company.

PROMOTION OF JESSE JENNISON.

The Cortland Carriage Goods Company announces the promotion of Mr. Jesse Jennison to the position of sales manager, the promotion dating from February 1, 1912.

Mr. Jennison has represented the Cortland Carriage Goods Company for the past nine years in the Eastern and Southern States and Canada, and for the present will continue to have immediate charge of the Southern trade in addition to the duties of sales manager.

The circle of friends and acquaintances among the carriage and accessory trade that Mr. Jennison has made during the past nine years will be pleased to know of his advancement.

DISPOSES OF HER INTEREST.

Miss Mabel Pitt, president of the Pitt-Mathews Carriage and Auto Company, Des Moines, Ia., has sold her interest in the factory to Edwin V. Mathews, vice-president and manager, and Richard G. Priebe, secretary. Miss Pitt has had the active management of the factory since the death of her father, J. E. Pitt, a year ago and is said to be the only woman president of a carriage factory.

Mr. Mather has been connected with the Pitt Carriage Company for twelve years and for a time was engaged independently in the carriage business. Mr. Priebe has been connected with the concern for eighteen years. For a time the concern will retain its present name, but the name of Pitt will be dropped at some future time.

TIRE PLANT FOR WEST VIRGINIA.

Warwood, near Wheeling, W. Va., is to have a manufacturing plant capitalized at \$100,000 and it will be ready for operation just as soon as the building purchased can be enlarged and machinery installed. The plant will be for the manufacturing of automobile tires of all kinds and grades. The old steel ceiling plant in North Warwood has been bought and will be made much larger for the tire industry. The principal promoters of the new factory are capitalists and business men of Pittsburg.

SECOND CLASS RATES ON DASHES.

The McKinnon Dash Company has received a letter from the Southern Classification Committee, which states the body will list the subject for discussion at its meeting held February 5. We presume there is now to be had later news concerning this important matter, but it has not come to hand, so we give the progress of the matter so far.

THE MATINEE GIRL.

Rubber! Of course we "rubber" when we see such a girl as the one by Artist Desch whose creation the Conso Rubber Tire Co. has had splendidly reproduced in color presented with its compliments to admirers of pretty g Kelly-Springfield tires.

STUDEBAKER RT

The Studebaker house celebrated its birthday was February 7. The company pleased to group three events of different years, Washington's birthday and the company's anniversary.

WANTS LIGHT

Eugene F. Lethbridge, Cl is in the market for a light small horse. Makers of this illustrated descriptive circular

VICTOR SECTIONAL TRUCK TIRES.

The Victor Rubber Co., of Springfield, O., is now ready to place the Victor sectional truck tire on the market, and claim it possesses the features of simplicity and durability essential to good service. The parts composing the tire are sections and locking bars, placed in a steel channel and the locking bars are bolted through the bottom of the channel and felloe. For simplicity and permanence of fastening the Victor Rubber Co. believes this device is unexcelled.

The fastening device consists of 5-16 inch high-carbon steel rods moulded in the sections and projecting $\frac{1}{4}$ -inch at the ends. The projecting rods are inserted in holes in the locking bars, and when the bars are drawn down tight there is a constant downward pressure on the rods that holds the sections perfectly until wholly worn out. The locking bars have walls in the center to prevent any endwise movement of the rods. The locking bars and sides of the channel form a square cup for the base of the section, and rubber being non-compressible prevents any wear around the rods. This feature has been satisfactorily demonstrated by use.

Truck manufacturers speak in favorable terms of sectional tires as possessing the features of less heating from work, better traction, less power required for propulsion, and with a superior fastening device the normal wear of the rubber can be obtained.

Victor sectional truck tires can be used both in single and dual form. The space between the sections being only about $\frac{5}{8}$ of an inch, produces no observable vibrations in the operation of the truck. Mr. H. H. Durr, the president, in writing about it, says:

"We have given this tire a pretty thorough test and we have had very satisfactory results. We worked first for efficiency and next for simplicity. Our experiments and testing have demonstrated the efficiency satisfactorily, and the simplicity is very apparent. For ease of application the Victor sectional tire has them all beaten to a finish. When the channels have once been applied and drilled the only thing necessary to put on new tires is a small wrench, and it can be done as readily in the midst of Sahara Desert as in the City of New York. Its application does not require the aid of a machine shop, a blacksmith shop or a hydraulic press."

BUILDS WAGON FACTORY.

Henry Augustin, a well known carriage maker at Oshkosh, Wis., will go into the manufacture of light wagons and carriages for the wholesale trade. He has a two-story frame building erected at the rear of his residence, at 294 Merritt street, and will equip it with up-to-date machinery, and run by a gasoline engine. The shop will be ready for business in a short time. An order of stock for 200 wagons being on the way now, most of them having already been ordered. Mr. Augustin plans to employ a small crew of men at first, and gradually to increase as business may warrant. He has been in the wagon and carriage business for years and has a wagon repair shop on ... In time he proposes to sell new wagons to jobbers and do no repair work.

KENTUCKY WAGON CO.

... general manager of the Kentucky Wagon Mfg. Company, ... develop this section of the business. The company is now making all kinds of wagons to the line of farm wagons for nearly forty years. Lumbering the classes of vehicles it is the evening of January 3 the ... eling men, W. C. Nones, the

WILL MAKE MORE VEHICLES IN 1912 THAN EVER.

An item appearing in a Flint, Mich., daily paper gives an account of an interview with W. A. Fisher, general sales manager of the Flint Wagon Works. It goes on to state that the Flint Works is preparing to handle a record business. The tenor of the article is quite optimistic, and was inspired after the recent meeting of the traveling force. Following is a part of Mr. Fisher's remarks:

"The carriage business was never brighter. We are looking forward to the best year's business in our history. At the present time we have orders for 3,000 vehicles to be shipped by March 1, and this is the largest number of orders we have ever had at this season of the year.

"We will make and sell more vehicles in 1912 than have ever been made and sold by the plant in any one year in its existence. I say this advisedly, after going over the matter carefully with 14 representatives from the company's largest sales districts."

The district sales managers, to which he refers, were called to Flint for a convention. The representatives studied the company's new line and suggested changes to make the line more suitable for their respective territories.

They were of one accord in their statements that business will be greatly increased over last year and that the carriage business never held brighter prospects than at the present time.

REORGANIZATION OF BRANTFORD CARRIAGE COMPANY.

A reorganization of the Brantford (Ont.) Carriage Co., was recently effected by which the Cockshutt Plow Co. has acquired a considerable amount of its stock. Mr. John Sanderson, of the Adams Wagon Company, has also become interested, and has been elected president. Preparations have been made for large extensions to the plant. The Cockshutt Plow Company will inaugurate an aggressive selling campaign now that the interests have been consolidated. The Cockshutt Co., has been pursuing a policy of acquiring plants, the output of which did not conflict with theirs.

WILL ESTABLISH CANADIAN FACTORY.

The Jewel Carriage Co., Carthage, O., will build a branch in Canada, near the American border, where automobiles will be manufactured for the Canadian market. The corporation borrowed \$25,000 to be used in erecting the Canadian factory. The company there will be separate from the Carthage plant, and will have a capitalization of \$600,000. Mr. Pratt said the reason for building a branch there was to escape the duties between the two countries and the fact that there is an exceptionally good market in the northern country for automobiles.

DOING A BRISK BUSINESS.

The Ohio Seat Company, 1964 Central Ave., Cincinnati, O., report business as "decidedly brisk," and that they are quite a little behind in their orders, and several good prospects in sight, which, when closed, will tax their output for some time to come. Mr. Frank Medeweller, proprietor of this concern, is a thoroughly up-to-date, practical woodworker and gives all orders his personal attention. This is one of the good reasons why the concern is "delivering the goods."

THE "CIRCLE S" FORGINGS.

The old established H. D. Smith & Co. concern at Plantsville, Conn., has always had a great name for its forgings of carriage parts. The new 1912 catalogue shows some new patterns and designs, but it cannot show the sterling quality of the product, but the trade knows of it.

Trade News From Near and Far

BUSINESS CHANGES.

J. F. Thrasher, dealer in vehicles, at Anniston, Ala., has sold out to J. R. Landham.

B. C. Schram has purchased the vehicle business of John J. Marsh, in Ida Grove, Ia.

F. E. Bayles has succeeded to the vehicle business of Wilkins & Miller in Bigelow, Kas.

C. M. Hanks has purchased the vehicle business of Frank Deland, in Marshall, Minn.

Tietgen Bros. have purchased the stock of vehicles, etc., of Henry Sen, in Sholes, Neb.

E. B. White has purchased the stock of vehicles, etc., of J. H. Deeds, in Smith Center, Kas.

Hoffman & Kinkaid have purchased the stock of vehicles, etc. of Hill Bros., in Randolph, Neb.

Carroll Bros. have disposed of their stock of buggies, etc., in Grinnell, Ia., to German & Lane.

B. Knese has disposed of his stock of buggies, etc., in Richmond, Minn., to Frank & Meyer.

E. J. Lorson has purchased the stock of vehicles, etc., of Wadick Bros., in Chapman, Kas.

Geo. H. Jurgens has purchased the N. Potts & Sons stock of vehicles, etc., in Milbank, S. D.

John Whitfield has purchased the stock of vehicles, etc., of George A. Morris, in Sterling, Kas.

G. C. Fairchild has disposed of his stock of carriages, etc., in Bertrand, Neb., to Erwin & Pedley.

The Fisher & Hicklin Mfg. Co. has purchased the business of H. Pinkepank, in Sweet Springs, Mo.

C. O. Gorton has disposed of his stock of vehicles, etc., in Kanawha, Ia., to Hamilton & Freerksen.

G. I. Parker has disposed of his stock of vehicles, etc., in Randolph, Neb., to Baniss & Kostman.

Carl Johnson has purchased the vehicle and implement business of Overtuff & Smock, in Ong, Neb.

E. A. Young has purchased the vehicle and implement business of C. H. Benedict, in Helena, Okla.

J. W. Moore has succeeded to the stock of vehicles, etc., of J. Mat Moore & Son, in Ardmore, Okla.

Fehr Bros. have disposed of their stock of buggies, etc., in Arlington, Kas., to Kirchner & Layman.

Henry Krahling has purchased the stock of buggies and implements of J. W. Stewart, in Atkins, Ia.

E. E. Kennear has purchased the stock of vehicles, etc., of John Atkinson & Son, in Berryville, Ark.

B. Rubertus has succeeded Rubertus Bros. in the implement and vehicle business in Montevideo, Minn.

Grant & Rudduck have purchased the stock of vehicles, etc., of W. H. Cattermole, in Northville, Mich.

F. B. Pennington, dealer in implements and vehicles at Clarinda, Ia., has sold out to Frank Creighead.

W. S. Marlin has purchased the stock of vehicles and implements of B. C. Fogle, in Williamsburg, Kas.

G. N. Whiting has disposed of his stock of vehicles, etc., in Giltner, Neb., to H. A. Bowman, of Lawrence.

Stevenson Carriage & Impelment Company has succeeded the J. N. Gray Carriage Company at Pueblo, Colo.

Eiler Bros. have purchased the implement and vehicle business of Gladowski Bros., in Platte Center, Neb.

Dennis Durkin has disposed of his vehicle and implement business in Frazee, Minn., to Schmidt & Poppler.

Lytle & Bird have disposed of their stock of vehicles and hardware in Gallatin, Mo., to W. E. Bray & Co.

Stenzel & Milberger have been succeeded in the vehicle and implement business in Olmnitz, Kas., by Milberger & Co.

NEW FIRMS AND INCORPORATIONS.

R. D. McKinley has opened a new stock of buggies, etc., in Sitka, Kas.

W. B. Hickman is about to open a new stock of vehicles, etc., in Hutchinson, Kas.

C. L. McVeigh is opening a new stock of vehicles and implements in Leedy, Okla.

F. W. McGray & Co. are about to open a stock of buggies, etc., in Douglas, N. D.

C. E. Simmot has opened a new stock of vehicles and implements in Beaumont, Cal.

M. Anderson has just opened a new stock of vehicles and implements in Kennard, Neb.

Denman & Filsinger have begun the erection of a new vehicle store and garage in Alda, Neb.

The Cathey Buggy Co. has been chartered in Salisbury, N. C., with a capital stock of \$20,000.

The Picard Buggy Co., has been incorporated in Jackson, N. C., with a capital stock of \$50,000.

Jacks & Cunningham are about to engage in the vehicle and implement business in Steele City, Neb.

F. A. Gates is erecting a store building in Spencer, S. D., and will put in a stock of vehicles, etc.

Nelson & Son, vehicle and implements dealers of Iowa Falls, Ia., are establishing a branch store in Alden.

W. E. Urie, of Kansas City, Mo., contemplates the opening of an automobile wheel factory in Tulsa, Okla.

Fred A. Shadbolt is erecting a new store building in Auburn, Wash., and will put in a stock of carriages, etc.

Danielson & Anderson have formed a partnership in the implement and vehicle business at Mankato, Minn.

Madison & Boyer, who have a vehicle and implement store in Goltry, Okla., are about to open another store in May, Okla.

Stoppie & Miller, of Dallas, Tex., will establish a plant for the manufacture of vehicles and farm implements in Muskogee, Okla.

The Whiffletree Attachment Co. has been incorporated at Lindale, Tex., with a capital of \$10,000 by W. P. Bradshaw, T. M. Bradshaw and Sam T. Morris.

Acme Body Co., Rahway, N. J., capital, \$100,000; to manufacture automobile, carriage and wagon bodies, has been incorporated by H. A. Grube, F. P. Gallagher and G. L. Freeman.

IMPROVEMENTS AND EXTENSIONS.

The Portland (Ind.) Body Works has increased its capital from \$24,000 to \$54,000.

The Dakota Plow & Wagon Co., is erecting a new factory building in Sioux Falls, S. D.

The American Auto Trimming Co., Detroit, Mich., has increased its capital from \$50,000 to \$150,000.

The Farmers Handy Wagon Co., Saginaw, Mich., has increased its capital from \$150,000 to \$300,000.

H. J. Sidner, of Nickerson, Neb., has moved his hardware stock to a new building and will use the old building for automobiles, etc.

The Michigan Buggy Co., of Kalamazoo, Mich., has opened a distributing agency in Toledo, O., and hereafter will actively push their Michigan "40" car in that territory.

The Huntingburg (Ind.) Wagon Works Co., which recently

purchased the plant of the Star Carriage Works, has awarded the contract for the erection of a large wareroom to the carriage plant.

The Jess & Sturdy Manufacturing Company, of Springfield, Mo., makers of all sorts of vehicles, have procured a lease on a building in Dublin, Tex., and will open a business there under the management of W. L. Allen, a member of the firm.

BUSINESS TROUBLES.

The directors of the Pontiac (Mich.) Wheel Company have asked that the circuit court appoint a receiver for the company, which is capitalized at \$90,000. The directors say several suits pending against the company have so embarrassed it that it cannot procure money to do business.

S. C. Pease & Sons, Newburyport, Mass., manufacturers of carriages, automobile bodies, hearses, etc., made an assignment January 23 for the benefit of creditors to B. Frank Sargent and Robert O. Patten. The receivers will operate the plant until such time as the creditors may determine.

On January 16 Judge A. W. Williams appointed William A. Castner, of Youngstown, O., receiver for the Keith-Kerr Carriage Company, of Sharon, Pa., upon petition of William M. Keith, treasurer of the company, in which the directors acquiesced. The receiver has taken charge of the plant and will keep it in operation. Mr. Keith stated that the receiver was asked owing to the slump in business and to protect the creditors and stockholders.

With creditors holding claims aggregating almost \$70,000, and with assets of \$31,000, the Early Motor Car Company on January 17 filed a petition in voluntary bankruptcy in the United States Court. John E. Jones, vice-president of the company, and Joseph H. Hays, attorney, made application for a temporary receiver. Judge Sater appointed Charles F. Brandt receiver. The largest creditor of the company is Dr. L. M. Early, president of the company, who made five cash advances, amounting to \$57,000.

Bankruptcy proceedings were instituted in the United States District Court at St. Louis January 11 against the Lindell Motor Company. The petition was presented by four individuals alleging claims aggregating over \$2,600. E. B. Campbell is president of the Lindell Company. W. H. Hand, his attorney, said the bankruptcy proceedings were the outgrowth of a stockholders' fight. The firm, which is incorporated for \$6,000, he declared, is perfectly solvent. He said the bankruptcy suit will be resisted.

FIRES.

The Monette (Ark.) spoke factory was destroyed by fire January 18. Loss \$3,000.

Wood & Wood, dealers in vehicles at Fort Worth, Tex., sustained a \$15,000 fire loss.

The stock of buggies, etc., of M. A. Collins, in Huntsville, Ala., has been destroyed by fire.

The stock of vehicles, etc., of A. C. Thompson, in Stratford, Okla., has been damaged by fire.

Fire destroyed the blacksmith shop of Schmidt & Storks wagon works at West Bend, Wis. Loss \$3,000.

The Movius Mercantile Co., general dealers in merchandise, hardware, furniture, undertaker, implements, vehicles, etc., at Lidgerwood, N. D., burned out. Loss \$100,000, insurance \$47,500.

The plant of the Durant-Dort Carriage Co., Flint, Mich., was saved from a big fire on January 12 by the operation of its sprinkler system which kept in check a lively blaze until the fire department arrived. The fire started in the paint department on the fifth floor.

All styles of carriage and material used in their construction, worth between \$18,000 and \$20,000, were destroyed by a fire which damaged the Rhein Brothers' Carriage Repository, 940

and 942 Linden avenue, Baltimore, Md., January 19. The property was only partially covered by insurance.

PERSONAL.

Russell E. Gardner, head of the Banner Buggy Company, St. Louis, Mo., is to have one of the finest yachts that ever plowed the Mississippi, according to reports from Alton, where the craft is to be built.

Shortly after the first of the year, the Kentucky Wagon Manufacturing Company held a meeting of the traveling salesmen of the company. A dinner at the Pendennis Club featured the meetings. W. C. Nones, head of the organization, acted as toastmaster, while S. M. Nones, vice-president and sales manager; W. P. Greusling, treasurer; J. J. Shelley, secretary, and others responded to toasts.

Arrangements having been made by the Emerson Brantingham Co., of which the Emerson Carriage Co. is a part, for the installation of a branch house at Indianapolis, Ind., the company will hereafter be represented in southern Ohio, Indiana, and Kentucky by the Emerson Carriage Company's representatives, consisting of P. C. Kirtley, manager, and P. L. Burford, M. L. Pittser and E. T. Crawford, travelers.

G. B. Storer, vice-president of the Standard Steel Tube Company is now manager of the Standard Wheel Company, Toledo, Ohio, whose advertisement covering a steel wheel will be found in the advertising pages of *The Hub*. The Standard Steel Tube Company is the parent company of this institution, and its splendid reputation for making and selling high class seamless steel tubing and bent tube specialties bespeaks for the Standard Wheel Company a vigorous sales campaign under Mr. Storer's management.

THE BUFFALO T. & T. CO.

The Buffalo T. & T. Company, Buffalo, N. Y., recently incorporated for the purpose of manufacturing tops and trimmings for automobiles and carriages, has purchased the stock, machinery and equipment of the top and trimming business formerly conducted by the Buffalo Auto Body and Trimming Co. and later by the United States Woodworking Co., at 104-108 Terrace, the old firms discontinuing in Buffalo.

The officers of the new company are Geo W. Walters, president; W. K. Dumar, vice-president; Daniel Brewer, secretary and treasurer. Mr. Dumar, who will have the active management, is a practical trimmer of long experience.

The business will be carried on at the old address where an up-to-date top and trimming plant has been installed with all facilities for quick handling of orders large or small.

BIG SPOKES, LITTLE SPOKES.

Not many wheel makers have the stock suitable to make big 6-inch spokes for heavy commercial trucks. The Standard Wheel Co., of Terre Haute, Ind., is one of the few. This vehicle wheel plant is splendidly equipped and organized and carries an unusual stock of raw wheel material. The works are also conspicuous for the output of carriage, wagon and truck wheels, claiming to be the most extensive of any concern.

The new No. 15 catalogue of the company is inclusive of automobile, tractor, fire apparatus and all other kinds of wheels.

WISCONSIN LOCAL ORGANIZES.

The implement dealers of Dane County, Wis., organized the Dane County Implement & Vehicle Dealers' Club at a meeting held at the Avenue Hotel in Madison, January 23. J. S. Cusick, of Oregon, Wis., president, presiding. The secretary of the club is John Hilgers, of Middletown. The meeting was attended by J. A. Craig, representing the National Implement and Vehicle Association.

Recently Granted Vehicle Patents

1,004,397—Vehicle Wheel. William H. Fahrney, Chicago, Ill.
 1,004,003—Resilient Tire. Richard A. Falkenberg, San Francisco, Cal.
 1,004,417—Wheel Construction. William H. Green, Colorado, Springs, Colorado.
 1,004,023—Wheel. John Helbeck, Houston, Tex.
 1,004,455—Spring Hub for Automobile Wheels. Chapman Minaker, Syracuse, N. Y.
 1,004,480—Vehicle Tire. Percy G. Seward, assignor to Seward Rubber Tire Co., Inc., Petersburg, Va.
 1,004,481—Vehicle Tire. Percy G. Seward, assignor to Seward Rubber Tire Co., Inc., Petersburg, Va.
 1,004,501—Vehicle Wheel. John C. Thoen, Burke, Idaho.
 1,004,318—Resilient Wheel. Robert L. Watts and A. G. Anstead, assignors of one-half to said A. G. Anstead and one-half to J. F. Erby, Waxahachie, Tex.
 1,004,953—Automobile Headlight. John H. Adams, New Haven, Conn.
 1,004,964—Dirigible Headlight. George J. Baker, assignor of one-half to P. Lacey, Republic, Pa.
 1,004,966—Demountable Rim. Frederic R. Barker, Boston, Mass.
 1,004,973—Automobile Steering Mechanism Lock. George W. Benton, Finley, N. D.
 1,004,988—Vehicle Wheel. John Callan, Globe, Ariz.
 1,004,626—Tire for Vehicles. Michael J. Cantor and E. Siegel, New York, N. Y.
 1,005,103—Wheel. Thomas S. Chestnut, Buffalo, N. Y.
 1,004,850—Wind Shield. Joseph Cogli, Central City, Neb.
 1,004,639—Pneumatic Tire Rim. Sylvester C. Force, San Francisco.
 1,005,021—Resilient Wheel. Vincente Gil-Deigado y Olazabal, Madrid, Spain.
 1,004,642—Rubber Tire. George H. Gillette, New York, N. Y.
 1,004,867—Vehicle Tire. Samuel H. Gilson, assignor of one-half to J. S. Milner, Salt Lake City, Utah.
 1,004,655—Wheel. Simon P. Johnson, Westpoint, Neb.
 1,004,658—Spring Tire. Joseph M. Keller, Philadelphia, Pa.
 1,004,884—Current Collector for Electrically Propelled Vehicles. Willy Kohler, Bremen, Germany.
 1,004,667—Vehicle Wheel. Louis B. Lodge, Cayuhoga Falls, O.
 1,004,582—Tire for Vehicle Wheels. William D. McNaull, Toledo, O.
 1,004,895—Tire. DeWitt Nelson, assignor to E. J. Phelps, Minneapolis, Minn.
 1,005,065—Automobile Truck. Herbert L. Parrish, Benton Harbor, Mich.
 1,005,068—Motor Vehicle. Stephan and A. E. Phillips, Cleveland, O.
 1,004,907—Automobile. Charles F. Rodin, San Francisco, Cal.
 1,004,695—Automobile Tire. Charles E. Scheuring, West DePere, Wis.
 1,004,703—Vehicle Wheel. Lonnie C. Smoot, Hillsboro, Tex.
 1,004,950—Tire. Howard O. Wilson, Ayrsworth, Neb.
 1,005,122—Tire. John M. Abrams, Bentley Manor, N. Y.
 1,005,589—Cushion Tire. Milton J. Atland, deceased, Dillsburg, Pa., C. Atland, administrator.
 1,005,135—Wind Shield. Arthur L. Banker, Pittsburg, Pa.
 1,005,682—Runner for Vehicles. William G. Bowers and S. B. Gardner, New Kensington, Pa.
 1,005,406—Guarded Spring Tire. Louis P. Brotherton, Los Angeles, Cal.
 1,005,607—Metallic Tire. James B. Crawford and J. R. Milliken, Sioux City, Iowa.
 1,005,170—Running Gear for Motor Vehicles. David M. Dearing, Jackson, Mich.
 1,005,171—Running Gear for Motor Vehicles. David M. Dearing, Jackson, Mich.
 1,005,626—Adjusting Mechanism for Lamps for Automobiles. Arthur J. Farrell, Pittsburg, Pa.
 1,005,627—Tire. Michel F. Flset, Jr. and L. A. Flset, Albany, N. Y.
 1,005,201—Pneumatic Cushion for Vehicles. Caleb S. Gurney, Portsmouth, N. H.
 1,005,215—Sleigh Attachment for Vehicles. Anton Hofacker, Newark, N. J.
 1,005,707—Elastic Wheel for Motor Vehicles. William P. Hoopes, Milton, Pa.
 1,005,440—Axle and Skeln. James R. Little, assignor to P. B. Williams and W. H. Covert, Quincy, Ill.
 1,005,449—Cushioning Device for Vehicles. Michael G. McGuire, Chicago, Ill.
 1,005,450—Vehicle. Carl H. Meyer, Washington, Pa.
 1,005,276—Vehicle Wheel. Hughes Moore, Louisville, Ky.
 1,005,291—Friction Driving Mechanism for Motor Vehicles. Edwin G. Owen, Wysox, Pa.
 1,005,470—Tire. Charles L. Rempes, Akron, O.
 1,005,473—Elastic Wheel Bearing. Gustaf Rennerfelt, Scranton, Pa.
 1,005,326—Cushion Tire. Phillip Schau, Kalamazoo, Mich.
 1,005,332—Automobile Spring Tire. Niram A. Schnelder, Mitchell, S.D.
 1,005,340—Vehicle Truck. Robert Siegfried, assignor by mesne assignments to Westinghouse Electric & Mfg. Co., Pittsburg, Pa.
 1,005,379—Removable Sleigh Runner for Vehicles. Joseph Walters, Detroit, Mich.
 1,005,399—Vehicle Wheel. Alfred R. Wylie and J. G. Wright, Big Spring, Tex.
 1,005,400—Vehicle Wheel. Alfred R. Wylie and J. G. Wright, Big Spring, Tex.
 1,006,350—Spring Wheel for Road Vehicles. George Bird, Earley, near Reading, England.
 1,006,055—Vehicle Wheel. Edward S. Bottomly, assignor to The Walk Auto Tire Co., Martinsburg, W. Va.
 1,006,179—Wheel. George J. Bradbury, Twinning City, D. C.
 1,006,376—Tire for Wheels. Frank Gallagher, Ridgeway, Iowa.
 1,005,960—Pneumatic Tire. Robert B. Gray, Port Carbon, Pa.
 1,005,962—Non-Pneumatic Elastic Tire for Vehicle Wheels. Oscar Grenier, Boulogne-on-the-Seine, France.
 1,006,219—Vehicle Wheel. Arthur C. Huckelbridge, Coldwater, Kas.
 1,006,384—Spring Wheel. Lewis Johnstone, deceased (W. B. Pritchard, Jr., executor), Chester, assignor of one-third to W. B. Pritchard and one-third to H. P. Mellor, Manchester, England.
 1,005,979—Cart. Perry A. Kalbaugh, San Diego, Cal.
 1,005,863—Automobile. William L. Miggett, Ann Arbor, Mich.
 1,005,891—Vehicle Wheel. Martin C. Schwab, Chicago, Ill.

1,006,265—Automobile Sleighing Attachment. Martin Olson, Coeur d'Alene, Idaho.
 1,006,295—Vehicle Tire. Frederick A. Schultz, Hasbrouck Heights, N. J.
 1,006,151—Dump Wagon. Walter A. Underhill, Auburn, N. Y.
 1,005,909—Wagon Running Gear. Fleming H. Weaver, assignor of one-half to J. A. Rice, Griffin, Spalding County, Ga.
 1,006,039—Gapped Wheel. Ernest G. Yeates, Hamilton, Ontario, Can.
 41,827—(Design)—Automobile Body. Frank P. Stone, Chicago, Ill.
 Copies of above patents may be obtained for fifteen cents each by addressing John A. Saul, solicitor of patents, Fendall Building, Washington, D. C.

RECENTLY EXPIRED PATENTS OF INTEREST TO THE VEHICLE INDUSTRY.

Patents Expired December 11, 1911.

530,521—Wagon Tire Heater. Isaac Harvey, Hartley, Iowa.
 530,537—Wagon Bed. Charles P. Lancaster, Jonesborough, Ind.
 530,550—Pneumatic Vehicle. Addison C. Rand, New York, N. Y.
 530,573—Doubletree. Francis M. Beaver, Pleasant Valley, Tex.
 530,608—Shifting Seat for Vehicles. George W. Stivers, New York.
 530,736—Wheel Rim. Edward Warwick, Birmingham, England.
 530,649—Vehicle Spring. George Penn, Syracuse, N. Y.

Patents Expired December 18, 1911.

530,977—Vehicle Body. Edward L. Tennant, Springfield, Ohio.
 530,990—Vehicle Wheel Rim. Frank L. Goodrich, Belvidere, Ill.
 531,061—Wagon Brake. William Petering, Center, Ohio.

Patents Expired December 25, 1911.

531,311—Vehicle Wheel. Carl von der Heyde, Milwaukee, Wis.
 531,339—Device for Supporting Vehicle Seats. Erik Selen, Utica, N. Y.
 531,454—Draw Bar for Vehicles. Richard Whalen, West Granville Corners, N. Y.
 531,493—Buggy Top Attachment. John D. Axline and James L. Ballie, Shawnee, O.
 531,558—Thill Coupling. Daniel Parker, Calvert, Tex.
 531,565—Thill Coupling. Frederick W. Rolf, Lawrenceburg, Ind.

Patents Expired January 1, 1912.

531,642—Whiffletree Hook. Lars P. Peterson, Hooper, Neb.
 531,672—Vehicle Brake. George W. Wise, Warner Lake, Ore.
 531,689—Spring Vehicle. Richard Mulholland, Dunkirk, N. Y.
 531,884—Thill Coupling. Thomas W. Watrous, Elmira, N. Y.
 The above lists of expired patents, trade marks and designs of interest to our patrons are furnished by Davis & Davis, solicitors of American and foreign patents, Washington, D. C., and St. Paul Building, New York City.

CHANGES IN FREEPORT.

On February 1, the Henney Buggy Company and the Freeport Carriage Company, subsidiary plants of the Moline Plow Company at Freeport, Ill., were placed under separate management instead of one manager having supervision over the two factories. C. W. Reynolds, who for the past year has been superintendent of the Freeport Carriage plant, will be the new manager of that branch. M. A. Steele will continue to manage the Henney plant.

The reason given for the change is that the factories are growing to such an extent that it is impossible for one manager to handle all of the work of the combination. Both the manager of the Henney plant, and the new manager of the Freeport Carriage branch are efficient men, of the kind that produce a large amount of business for a concern. Mr. Steel has been manager of the Henney plant for the past seven years and has proven very satisfactory.

RECEIVERS MADE GOOD SHOWING.

L. W. Radina and P. S. Phillips, receivers of the Millcreek Wagon Company, filed a report in the Common Pleas Court January 15 showing that on December 31, 1911, the assets of the company amounted to \$122,138.08, while it had on hand orders amounting to \$28,430.08. The liabilities were reported as \$72,914.66. The receivers were appointed December 8, 1908, and in the three years they operated the plant the business done amounted to \$477,379.71. The assets when they took hold were appraised at \$3,781.96. The report stated that the business on hand was very profitable and that if the plant was operated another year it would be to the material benefit of the creditors, as it could then be sold at a good price as a going concern.

OBITUARY

Wm. F. Jessup, president of the Wayne Wheel Co., Newark, N. Y., died January 1, aged 72 years, of heart failure. Mr. Jessup was born in Newark and spent practically all of his life in the wheel business. He served with distinction in the civil war, holding the office of first lieutenant when mustered out at the close of the war. After the war he went to Greenville, Mich., where he married Miss Hannah Peacock in 1875. On his return east he became connected with the Shortsville Wheel Co., then the Rochester Wheel Co., and finally the Wayne Wheel Co., at Newark, of which he was president and manager at the time of his death. Mr. Jessup is survived by his widow and one son, R. W. Jessup, at present secretary and assistant treasurer of the Wayne Wheel Co., who will conduct the business in the future.

Edwin Morrill, a pioneer carriage manufacturer of Amesbury, Mass., died at his home in that city January 15 at the age of 81 years and 10 months. He survived his wife only eight days. Between 1855 and 1865 he made carriage bodies in a shop opposite his late residence supplying the very few manufacturers at that time. Then he began the manufacture of finished carriages which he continued until about eighteen years ago. In the early days of the Carriage Builders' National Association he was an active member. H. E. Morrill, of Dayton, O., a son, is still connected with the carriage trade.

Jackson G. Smith, 79, a pioneer buggy builder of Barnesville, Ga., died December 24. He was one of the oldest builders in the South, having established the Barnesville buggy business in 1866. From a small beginning it grew to large proportions, and now has a yearly output of 10,000 vehicles. Some time ago the company was incorporated as J. G. Smith & Sons, with J. G. Smith as president. The surviving members are M. W. Smith, vice-president, and W. B. Smith, secretary.

Marshall B. Van Arman, who has been engaged in carriage building in Joliet, Ill., a quarter of a century, died February 4. Mr. Van Arman was born in Franklin, Canada, in 1853 and moved to Joliet in 1888, starting the carriage making business which he has continued since that time. He is survived by the wife and one son, Marshall Edward Van Arman.

George Enger, formerly a carriage builder in Cincinnati, O., died January 17th at the age of 64 years at South Orange, N. J. Mr. Enger was a native of Cincinnati. He started in the manufacture of carriages when a young man, and when he retired sixteen years ago, he was reputed to be wealthy. A widow and two daughters survive him.

William Brandt, a pioneer manufacturer of wagons and trucks in New York, died on January 14, at the home of his daughter, 745 Forest avenue, in the Bronx. He came to this country from Germany sixty years ago. Five daughters, seven sons and twenty-six grandchildren survive him.

Frederick W. Lehbrick, fifty-six years old, traveling salesman for the United States Carriage Company, of Columbus, O., died from rheumatism of the heart at his apartments in the Kenyon Hotel, Salt Lake City, Utah, January 30. The body was sent to Kansas City, Mo., for funeral service and burial.

Albert James Williams, sixty-five years old, a pioneer carriage manufacturer of St. Joseph, Mo., died January 20. He had been confined to the house for a year with Bright's disease, and a few weeks ago pneumonia developed. He is survived by his widow and two children.

Ashbel Fairchild Laughead, aged 80, died at his home at Morgantown, W. Va., January 13. He was a member of the firm of Fairchild Laughead & Co., manufacturers of carriages, with factories in Uniontown, Pa., and Morgantown and Clarksburg, W. Va.

Lovin D. Gass, cashier of the First National Bank of Danville, Ill., died January 18, aged 53. He was a colonel in the Illinois National Guard and president of the Danville Buggy

Company and treasurer of the Vermilion County Telephone Co.

George W. Eighmy, 69, for twenty-five years a carriage builder of Springboro, Pa., dropped dead while in the office of a customer in Butler County recently. Mr. Eighmy was well known to the trade throughout Pennsylvania.

Elmer E. Kuqua, 48, vehicle manufacturer of Springfield, O., died January 11 at St. Petersburg, Fla., where he had gone for the benefit of his health. Mr. Kuqua had been in the carriage trade for twenty-five years.

Alvin Saltsman, St. Johnsville, N. Y., for a long time engaged in the manufacture of carriages under the firm name of Saltsman Bros., died January 4. He was also a director in the local bank.

A. W. Flanders, an old time vehicle dealer of Bradley, S. D., is reported dead.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department, 5 cents a word; Initials and figures count as words. Minimum price, 30 cents for each advertisement.

POSITION WANTED.

Position Wanted as blacksmith foreman and assistant superintendent of carriage factory. Have been filling both of above positions in popular priced carriage factories for many years; thoroughly experienced and willing to work. Address Peter Steinbecker, 109 Linden St., Carthage, O.

Position Wanted—By experienced foreman blacksmith, carriages or wagons. Organizer, honest and reliable. Or would also consider a road job. I want to change localities. Can furnish A-1 references as to push, honesty and sobriety. Address H-103, care The Hub, 24 Murray street, New York City.

HELP WANTED.

Wanted—Competent carriage or automobile draftsman with experience in body designing. Must understand retouching and perspective and be capable of making a finished wash drawing. Permanent work for the right man. Address, stating experience and salary wanted Box 104, The Hub, 24 Murray street, New York City.

Wanted—Carriage trimmer on light work. Clarence Randall, Newtown, Pa.

WANTED—MANAGER FOR LARGE WAGON WORKS.

A large manufacturing company having influential backing, located Southern States and manufacturing high class tank, stake, express, laundry, delivery and business wagons, is looking for a live, capable, experienced, progressive man to take entire charge of its plant and business as manager. Applicants for the position must have had previous experience in the management or general superintendence of similar plants. Good salary and attractive opportunities to the right man. Address P. O. Box 1805, Houston, Texas.

Wanted—Manager for automobile body plant in the Middle States, employing over 500 men, doing high grade work. Bodies are covered with steel or aluminum pressings. Want only man thoroughly competent and experienced, who is resourceful and capable of handling the men, who can take entire charge of the plant. He must be absolutely honest and know how to manufacture bodies to advantage. Correspondence solicited. State experience in detail, age, whether married or single, salary expecter, and other pertinent information. We are looking for the right man. He must be a big man. We are ready to pay a good salary. Address Mich, care The Hub, 24 Murray St., New York City.

SECOND-HAND MACHINERY WANTED.

We are in the market for the following second-hand machinery in good condition: One Defiance No. 1 Improved Tire Bender, one West Hydraulic Tire Setter No. 4, one Long & Allstetter Tire Welder No. 2. Send full description and lowest price to Avoca Wheel Co., Avoca, N. Y.

WE PAY

for information dealing with organization of corporations manufacturing and sell motor cars. Reply H. G., 21, care The Hub, 24 Murray street, New York City.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

INDEX TO ADVERTISERS

American Roller Bearing Fifth Wheel Co. 12	Herbrand Co. 18	Payne, E. Scott & Co. 18
Bicknell Mfg. & Supply Co. 3rd cover	Higgin Mfg. Co. 4th cover	Pettingell Machine Co. 5
Bowling Green Motor Car Co. 3rd cover	Hoopes Bros. & Darlington 2nd cover	Porter, H. K. 12
Buckeye Handle, Gear & Bending Co.... 18	Hotel Cumberland 6	
Buckeye Paste Co. 18	Jones & Co, Phineas 15	Racine Auto Tire Co. 16-17
Burling, W. G. 18	Indianapolis Paste Co. 18	Sherwin-Williams Co. —
Baltimore Hub & Wheel Co. 18	Keystone Sheet Metal Co. 4th cover	Standard Steel Tube Co. 16
Buffalo T. & T. Co. 12	Keystone Paint & Filler Co. 15	Standard Wheel Co., Terre Haute, Ind...—
Consolidated Ruber Tire Co. 1st cover	Landers Bros. Co. 17	Standard Oil Cloth Co.
Columbus Bolt Works4th cover	Lewis Spring & Axle Co. 15	H. Collier Smith & Co. 12
Crane & MacMahon 2nd cover	Masury, John W. & Son2nd cover	Smith, L. M. & Son 18
"Crescent" Body Warks 18	Mayo Radiator Co. 6	Stinson & Son, Edw. 18
	Meyer & Co., John C. 18	Straus & Son, 6
Decker, J. C.3rd cover	Miller, A. J. & Co. 12	Schlegel Mfg. Co. 13
Delphos Hoop Co. 18	Millikan, G. W. 18	Timken Roller Bearing Co. 1
Devoe, C. T. & Raynolds Co.3rd cover	McKinnon Dash Co. 4th cover	United Rim Co. 2
Diefenthaler, J. V. 4	Metropolitan Lamp Co. 18	Valentine & Co. 3
Dowler, Charles L. 18	Moore & Co., Benj. 13	Victor Rubber Co. 11
Eccles, Richard Co. 12	Eureka Mower Co. 20	West Tire Setter Co. 17
	National Spring & Wire Co. 6	Woodman, Joel H. 18
Fabrikoid Co. 4	New Wapakoneta Wheel Co. 1	Willey & Co., C. A. 16
Fairfield Rubber Co. 3rd cover	Ochsner & Sons Co., A. 18	Willcox Mfg. Co. 14
Frost Gear & Machine Co. 15	Ohio Sea Co. 18	
Gifford, John A. and Son 15		

VICTOR SECTIONAL TIRES



The Truck Tire

That is Strongest in Construction, Simplest in Application, Most Satisfactory in Service.

Every Block Independent in Its Fastening.

Can be Used Single or Dual. Perfect Traction. More Resilient than Endless.

Write for Quotation and Guarantee.

VICTOR RUBBER CO.

Springfield, Ohio

Please mention "The Hub" when you write.



No. 361 Bentwood Seat.

A. J. MILLER & CO.
BELLEFONTAINE, OHIO
Makers of
VEHICLE
BOOIES and SEATS

AUTO and CARRIAGE TOPS
and **TRIMMINGS**, any quantity,
Built Quick Prices Right

BUFFALO T. & T. COMPANY
108 Terrace, Buffalo, N. Y.

Richard Eccles Co., Auburn, N.Y.

Manufacturers of

Forgings: Carriage, Wagon, Automobile' Special

Send for Catalogue No. 17.

PORTER'S BOLT CLIPPERS

"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 inch.

H. K. PORTER, EVERETT, MASS.

Carriage Mechanics

Desiring to improve their present
Condition should attend the

TECHNICAL SCHOOL

FOR

Carriage Draftsmen and Mechanics

SUPPORTED BY THE

Carriage Builders' National Ass'n.

The object of the School is to teach men to design vehicles and make working drawings, and to otherwise facilitate their work in the shop. Only those men employed in carriage or automobile building or their accessory trades are admitted to its privileges.

The classes are conducted in three divisions, viz.: Corresponding, Day, and Evening. The former is open during the entire year, while the day and evening classes are in session only from October 1st to April 1st.

The tuition is moderate.

For prospectus and full particulars, write to the instructor,

ANDREW F. JOHNSON,

18 West Forty-fourth St.,

NEW YORK CITY.

HOTEL LATHAM

5TH AV. AND 28TH ST.

NEW YORK

For Permanent and Transient Guests

EUROPEAN PLAN

Sample rooms for commercial men

Table d'Hote Luncheon, 50c

CLUB BREAKFASTS, ALSO A LA CARTE

ROOMS WITH USE OF BATH, \$1.50 PER DAY

ROOMS WITH BATH, \$2. \$2.50 \$3. \$4. PER DAY

A. L. PRATT

MANAGING DIRECTOR

The "Quickwork" Rotary Shear



These samples left the shear as flat as die work.

The "Quickwork" Rotary Shear is the only shear on earth that will cut steel like this sample.

SAVES ITS COST IN A FEW MONTHS.

Write for full information **H. COLLIER SMITH** Sole Inventor and Manufacturer.
125 Harper Ave., DETROIT, MICH.

TRUCK BUILDERS

If you only realized the inestimable value of roller bearing fifth wheels on trucks, vans, delivery wagons and all other medium and heavy vehicles, no job would leave your shop without

Roller Bearing Fifth Wheels

WHY? The adjustment is perfect. No oil or grease required. Almost indestructible. Will outwear any vehicle. Saves horseflesh and prolongs life of vehicle. Ask your jobber for the celebrated

NIELSON OR KING

Let us send you Catalogue and Price List.

American Roller Bearing Fifth Wheel Co.

745 THIRD AVE., BROOKLYN, N. Y.

ADVERTISEMENTS CLASSIFIED

AUTOMOBILES

Bailey, S. R. & Co., (elec.) Amesbury, Mass.

AXLES

Flint Axle Works, Flint, Mich.
 Frost Gear & Machine Co., Jackson, Mich.
 Lewis Spring & Axle Co., Jackson, Mich.
 Timken Roller Bearing Co., Canton, O.

BODIES, SEATS, ETC. (Wood and Metal)

Burling, W. G., Philadelphia, Pa.
 Crescent Body Works, Reading, Pa.
 Keystone Sheet Metal Co., Ambridge, Pa.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Wiggers Co., Cincinnati, O.
 Woodman, Joel H., Hoboken, N. J.

BOLTS AND NUTS

Columbus Bolt Works, Columbus, O.
 Russell, Burdall & Ward Bolt & Nut Co.,
 Port Chester, N. Y.

BOWS (Automobile and Carriage)

Millikan, G. W., Muncie, Ind.
 Delphos Hoop Co., Delphos, O.

BUCKRAMS.

Landers Bros. & Co., Toledo, O.

BUGGIES

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

CARRIAGE FORGINGS.

Columbus, Bolt Works, Columbus, O.
 Cowles & Co., C., New Haven, Conn.
 Eccles Co., Richard, Auburn, N. Y.
 Herbrand Co., Fremont, O.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.

CARRIAGES AND WAGONS (Finished)

Bailey & Co., S. R., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

**CARRIAGE, WAGON AND AUTOMOBILE
HARDWARE, SUPPLIES, ETC.**

Chas. L. Dowler, Philadelphia, Pa.
 Gifford & Son, John A., New York City.
 Higgin Mfg. Co., Newport, Ky.
 Payne Co., E. Scott, Baltimore, Md.
 Landers Bros. Co., Toledo, O.
 Mohawk Valley Mfg. Co., Utica, N. Y.

COMMERCIAL MOTOR WAGONS, TRUCKS

Bowling Green (O.) Motor Car Co.

CUSHION MFGRS.

Chas. L. Dowler, Philadelphia, Pa.

COLORS

Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 Valentine Varnish Co., New York, Chicago,
 Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

DASHES, FENDERS, ETC.

McKinnon Dash Co., Buffalo, N. Y.
 Burling, W. G., (Metal) Philadelphia, Pa.

DISPLAY RACKS.

H. G. Dreyer & Son, Cleveland, O.

FIFTH WHEELS.

Eccles Co., Richard, Auburn, N. Y.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.
 American Roller Bearing Fifth Wheel Co.,
 Brooklyn, N. Y.
 Keystone Forging Co., Northumberland, Pa.

GEAR WOODS.

Buckeye Handle, Gear & Bending Co., Alliance, O.

JACKS

Eureka Mower Co., Utica, N. Y.

LEATHER, PATENT AND ENAMELED

Diefenthaler, J. V., Newark, N. J.
 M. Straus & Sons, Newark, N. J.
 L. M. Smith & Son, Newark, N. J.

LEATHER SPECIALTIES

Decker, J. C., Montgomery, Pa.

LINSEED OIL

Sherwin-Williams Co., Cleveland, O.

MACHINERY AND TOOLS.

Bokop, Webb & Palm, Defiance, O.
 Porter, H. K., Everett, Mass.
 West Tire Setter Co., Rochester, N. Y.
 Frost Gear & Machine Co., Jackson, Mich.
 Pettingell Machine Co., Amesbury, Mass.

MACHINERY. (Woodworking)

Bicknell Mfg. & Supply Co., Janesville, Wis.
 Pettingell Machine Co., Amesbury, Mass.

MOUNTINGS (Including Lamps)

Crowe Name Plate & Engraving Co., Chicago
 Ochsner & Sons Co., A., New Haven, Conn.
 Metropolitan Lamp Co., Newark, N. J.

MUFFLERS (Auto)

Mohawk Valley Mfg. Co., Utica, N. Y.

PASTE

Buckeye Paste Co., Columbus, O.
 Indianapolis (Ind.) Paste Co.

RADIATORS.

Mayo Radiator Co., New Haven, Conn.

RIMS.

United Rim Co., Akron, O.

ROLLER CHAFE IRONS

Mohawk Valley Mfg. Co., Utica, N. Y.

RUBBER TIRES**Autos, Pneumatics, Etc.**

Consolidated Rubber Tire Co., New York Cy.
 Racine Auto Tire Co., Racine, Wis.

Carriages, Solid, Etc.

Consolidated Rubber Tire Co., New York Cy.
 Victor Rubber Co., Springfield, O.

SEATS

Keystone Sheet Metal Co., Columbus, O.
 Ohio Seat Co., Cincinnati, O.
 Miller, A. J. & Co., Bellefontaine, O.

SLEIGH RUNNERS.

Schofield & Co., Freeport, Ill.

SHAFT COUPLINGS.

Eccles Co., Richard, Auburn, N. Y.
 Higgin Mfg. Co., Newport, Ky.

SHAFT STRAPS.

Decker, J. C., Montgomery, Pa.

SPRINGS (Cushion)

National Spring & Wire Co., Jackson, Mich.

SPRINGS, GEARS, ETC.

Frost Gear & Machine Co., Jackson, Mich.
 Lewis Spring & Axle Co., Jackson, Mich.
 Schubert Bros. Gear Co., Oneida, N. Y.

THREADS

Meyer & Co., John C., Lowell, Mass.

TRIMMING MATERIAL

Rubber Drills, Enameled Goods, Imitation
 Leather, etc.

Fabrikoid Works, Newburg, N. Y.
 Fairfield Rubber Co., Fairfield, Conn.
 Standard Oil Cloth Co., New York City.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Landers Bros. Co., Toledo, O.
 Schlegel Mfg. Co., Rochester, N. Y.

TOPS

Buffalo T. & T. Co., Buffalo, N. Y.

VARNISHES, PAINTS AND JAPANS

Devos, F. W., and C. T. Reynolds, N. Y. C.
 Keystone Paint & Filler Co., Muncie, Pa.
 Moore & Co., Benj., Cleveland, O.
 Moller & Schumann Co., Brooklyn, N. Y.
 Masury & Son, J. W., New York and Chicago
 Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 Valentine Varnish Co., New York, Chicago,
 Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

VEHICLES.

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

WHEELS AND WHEEL STOCK.

Baltimore Hub & Wheel Co., Baltimore, Md.
 Crane & MacMahon, New York City.
 Union City Wheel Co., Union City, Ind.
 Gifford & Son, John A., New York City.
 Hoopes Bros. & Darlington, West Chester, Pa.
 Jones & Co., Phineas, Newark, N. J.
 New Wapakoneta Wheel Co., Terra Haute,
 Ind.
 Stinson Edw. W. & Co., Baltimore, Md.
 Standard Wheel Co., Terra Haute, Ind.
 Standard Wheel Co., Toledo, O.
 Shortsville Wheel Co., Shortsville, N. Y.

STEEL WHEELS

Standard Wheel Co., Toledo, O.

WOOD STOCK, BENT WOOD, ETC.

Buckeye Handle, Gear & Bending Co., Alliance, O.
 Crane & MacMahon, New York City.
 Delphos Hoop Co., (Bows) Delphos, O.
 Gifford, John A. & Son, New York City.
 Millikan, G. W., Muncie, Ind.
 Woodman, Joel H., Hoboken, N. J.

WHITE LEAD.

Sherwin-Williams Co., Cleveland, O.

MISCELLANEOUS

Oliver Typewriter Co., New York—Chicago

THE SCHLEGEL MFG. CO

Canopy Top Fringe
 Broad Lace

Manufacturers of

Seaming Lace
 Pasting Lace
 Holder Tassels
 Curtain Cord
 Door Cord
 Rosettes
 Tufts

**Fast Color Carriage and
 Automobile Trimmings
 of HIGHEST QUALITY**

Frogs
 Speaking Tubes
 Hat Racks
 Luggage Carriers

ROCHESTER,

N. Y.

THE SURPRISE IS YOURS

When You Open Your First Can of

MOORE VARNISH

Easy Working Perfect Flowing Long Lived

Highest Quality Under Every Label

BENJAMIN MOORE & COMPANY

Varnish Makers

New York

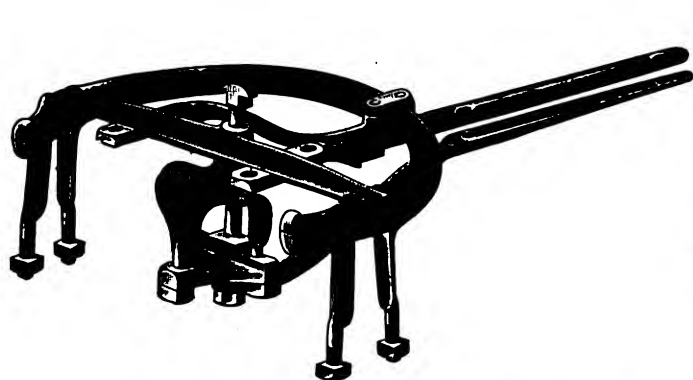
Chicago

Cleveland

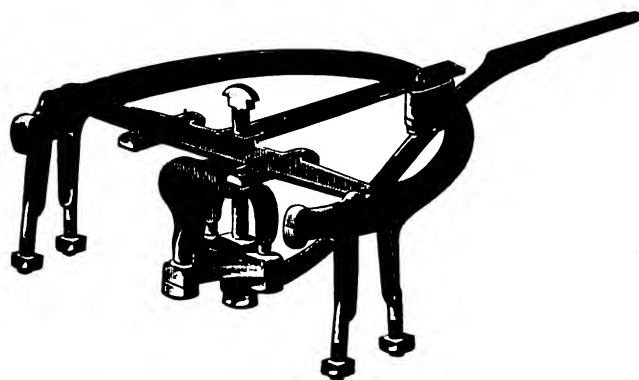
Toronto

Please mention "The Hub" when you write.

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



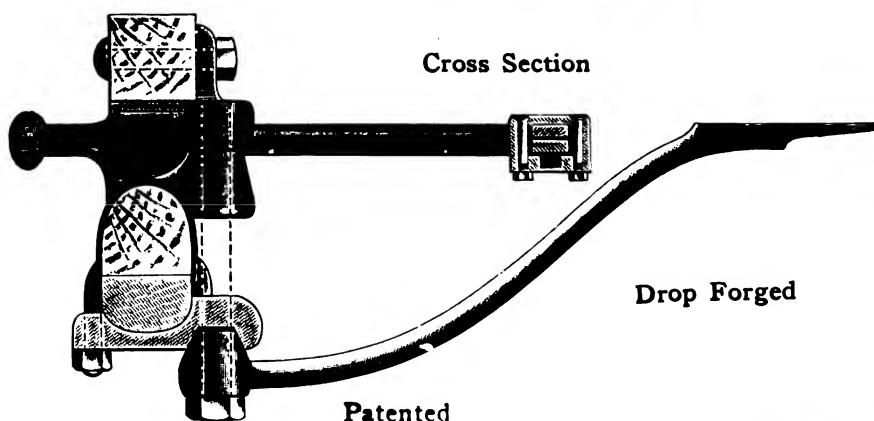
No. 1908—Gear Iron



No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.

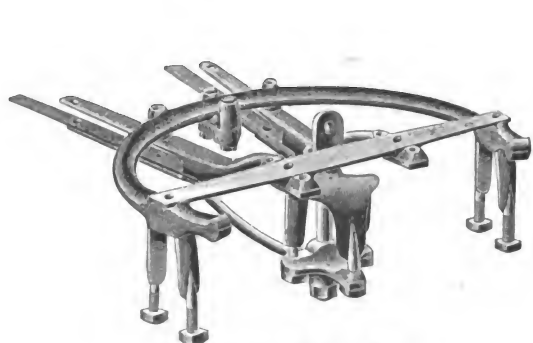


Cross Section

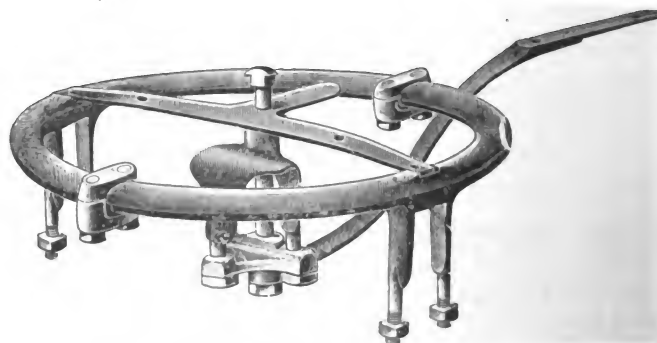
Drop Forged

Patented

S
U
R
E
S
A
F
E



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

SPRINGS

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

GEARS

We have Automobile
Gears for every purpose
in stock upon which
we can save you money.

FROST GEAR & MACHINE COMPANY
JACKSON, MICHIGAN



KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

It fills the pores of Metal and Wood perfectly. Sand-
papers easily and produces a fine, smooth surface
that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

Jones Wheels

BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.

NEWARK, N. J.

Branch Factory:

12th Ave. and 55th St., New York City.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and that's good news involved in the handling of

THE RACINE AUTO TIRE

We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

WILLEY'S COLORS

The **RECOGNIZED STANDARD**



C. A. WILLEY CO.

COLORS GRINDERS

and Manufacturers of Specialties in

CARRIAGE, AUTOMOBILE AND CAR

PAINTS

COLORS, VARNISHES, ETC.

HUNTER'S POINT, NEW YORK CITY

THE STANDARD STEEL TUBE COMPANY

Manufacturers of

STEEL TUBING

SPECIAL BENT TUBES for
AUTOMOBILES, MOTOR-
CYCLES, BICYCLES and
MACHINERY of all kinds
a specialty. . . .

Toledo, Ohio,

U. S. A.

Please mention "The Hub" when you write.

CUSTOMER·A·SATISFIED·CUSTOMER

BECAUSE, those cup-like studs that you see in our illustration will grip the ground just where, and just when, the ground needs gripping; so that he is free from the danger of skidding and slipping.

BECAUSE, his tire EXPENSE account will show a difference such as will cause him to talk enthusiastically to others about you and the RACINE AUTO TIRE.

All this counts for good business; so get busy. The RACINE AUTO TIRE is going into the hands of live, pushing dealers. We shall make it equally advantageous to them as to us. Be amongst the live ones. Take our proposition. Do it now; and together let us do it thoroughly.

RACINE AUTO TIRE COMPANY

500 14th Street

RACINE, WISCONSIN



DETROIT - MICHIGAN

HOTEL NORMANDIE

GEORGE FULWELL, Prop'r., Congress St., Near Woodward Ave.

150 Rooms, 50 With Bath
Hot and Cold Running Water and Telephone
in All Rooms

Americap Plan European Plan
\$2.50 per Day and Up. \$1.00 Per Day and Up.

Cafe, Restaurant and Buffet in Connection
Prices Moderate.

The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE



Tires set cold in one minute. This machine saves time—does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim, and thus make the tire loosen prematurely.

Saves resandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

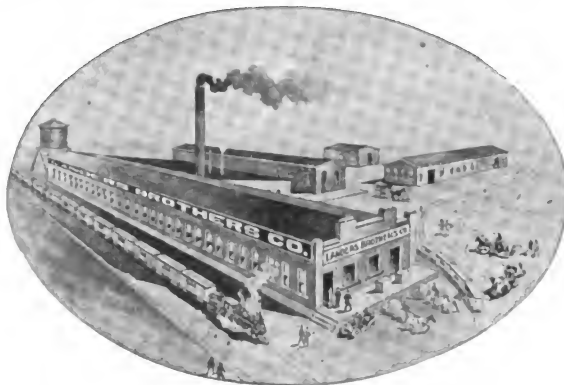
WEST TIRE SETTER CO.,

ROCHESTER, NEW YORK

Buckram, Webbing,

Made in Our Factory

Burlap, Strain Straps, Celluloid



Top Material,
Fibre Cord,
Wadding,
Enamelled Muslins, Drills and Ducks

Sheeting,
Bow Lining,
Cushion Canvas,

Landers Brothers Co.,
TOLEDO, OHIO.

Prompt Shipments

Best Goods

Lowest Prices

BUSY BUYERS BRIEFS

John C. Meyer & Co. Threads
Manufacturers of
HIGH GRADE
and **SPOOL SILKS** for Carriage
and Automobile Trade
LOWELL, MASS.

The "CRESCENT" Body Works
Reading, Pa.
Builders of High Grade **Auto Bodies** to order
Of Wood or Metal in the White or Finished.

L. M. SMITH & SON
Leather
Carriage, Furniture and Automobile
NEWARK, N. J.
59-71 Lock St. 234-236 Central Ave.
Office 59 Lock St.

G. W. MILLIKAN
Manufacturer of
HIGH GRADE BOWS OF ALL KINDS
AUTO BOWS a Specialty.
Muncie, Ind.

Baltimore Hub-Wheel & Mfg. Company
Manufacturers of
Wheels **AUTO MOTOR CAR CARRIAGE WAGON**
Also SPOKES and RIMS
Factory: Harford Ave. and B. & O. R. R.
BALTIMORE MD.

CHARLES L. DOWLER
CARRIAGE AND WAGON HARDWARE
108 North Third St., Philadelphia, Pa.
CUSHION MAUFACTURER
Pure Stearic Acid Candles. Wheel Stock. Snow
Flake Axle Grease.

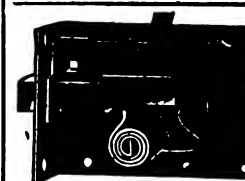
Special Carriage Trimmers Paste
GUARANTEED VERMIN PROOF
Get our prices on our No. 38 before
making your 1912 contracts.
BUCKEYE PASTE CO.
COLUMBUS, OHIO *The Hub*

METAL PARTS FOR MOTOR BODIES
Hammered Work a Specialty
Fenders, Gasoline Tanks, Japanning Ovens
W. G. Burling
1924 Commerce Street,
PHILADELPHIA, PA.

DELPHOS HOOP COMPANY
MANUFACTURERS OF
HIGH GRADE BUGGY and AUTOMOBILE BOWS
Delphos, Ohio
No Order Too Large Or Too Small Mention HUB

OHIO SEAT COMPANY
CARRIAGE AND AUTO WOOD WORK
SEATS OF EVERY DESCRIPTION
1964-66 Central Ave. CINCINNATI, O.
Frank Medeweller. Prop.

Carriage Trimmers' PASTE
Fourteen years the standard
OUR LATEST PRODUCT
"Trimmers' Stickstay"
A Sure-Sticking Dry product that WILL NOT FREEZE.
Free Samples on Demand.
INDIANAPOLIS PASTE CO., Indianapolis, Ind.



A. Ochsner & Sons
COMPANY
1061 State St. N. E. Cons.
Auto and Carriage
Locks, Hinges, Fix-
tures, Etc., and
Bodymakers Tools

Quality, Style, Durability and Quick
Delivery.

The Edward Stinson Mfg. Company
VEHICLE WHEELS
327-335 North Street, BALTIMORE, MD.

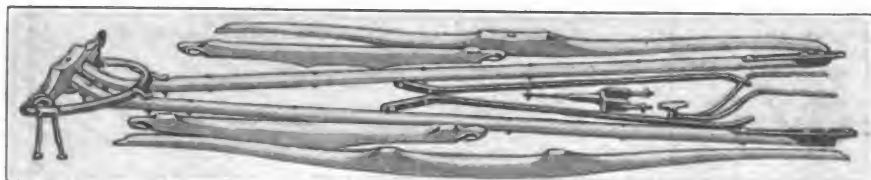
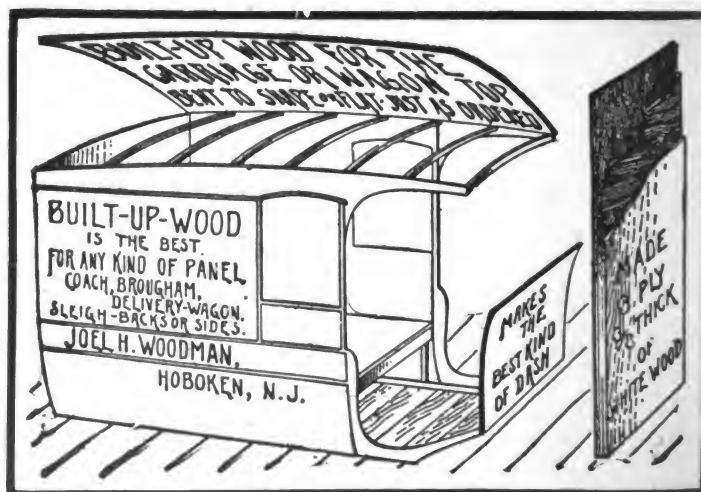
H. Weichhold L.D. Phone, 2290-W Market
METROPOLITAN LAMP COMPANY
Manufacturing and Repairing of
AUTOMOBILE SEARCH and SIDE LAMPS
COACH and CARRIAGE LAMPS
Makers of All Kinds of Metal Goods. Nickel
and Silver Plating.
24 Mechanic St., NEWARK, N. J.

E. SCOTT PAYNE CO.
Carriage and Automobile
HARDWARE
Horse - Shoers' Supplies
362-364 North Gay St., BALTIMORE, MD.

The Herbrand Company
Fremont, Ohio.

MANUFACTURERS OF
HIGH GRADE
CARRIAGE AND AUTOMOBILE
FORGINGS

AND DROP FORGED WRENCHES



The Buckeye Handle Gear & Bending Co.
ALLIACE, OHIO

Manufacturers of Gear Woods
OUR OLD RELIABLE GEAR SET
The Most Complete Set on the Market. Write for Catalogue and Prices

Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

F. W. DEVOE & CO'S { COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S { COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

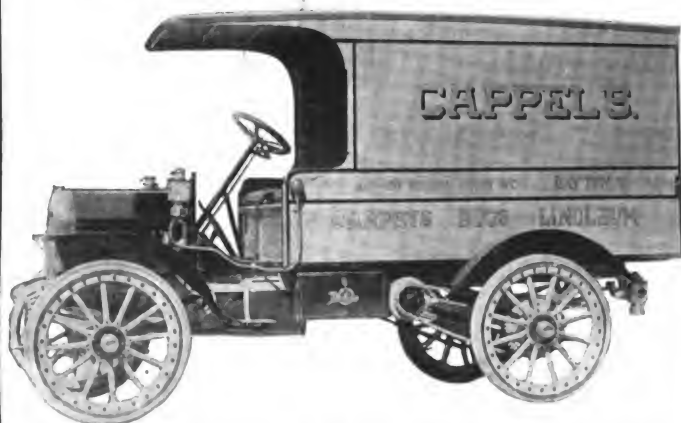
FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.

THE MODERN CARS FOR MODERN WAYS

QUIET RUNNING BUT POWERFUL

BEST SHOWING in Chicago-Detroit Reliability Contest. The ONLY CAR in its class making ENTIRE RUN ON ITS OWN POWER.



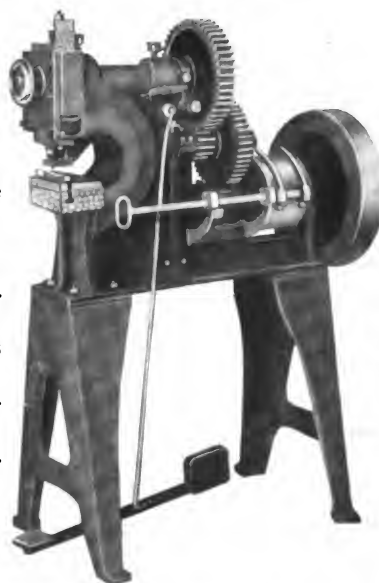
Model A—Engine, 10 H.P., 4-cycle; transmission selective; wheels 36x2, 36x3½ in. solid, capacity 1500-2000 lbs.

Model B—Engine, 22 H.P., 4-cycle; transmission selective; wheels, 32x3½, 33x4 in. pneumatic; capacity 500-1000 lbs.

The BOWLING GREEN MOTOR CAR CO.
BOWLING GREEN, O.

BICKNELL'S No. 90-B Punch and Shear

Designed
for close
work such
as punch-
ing tires
and simi-
lar work.

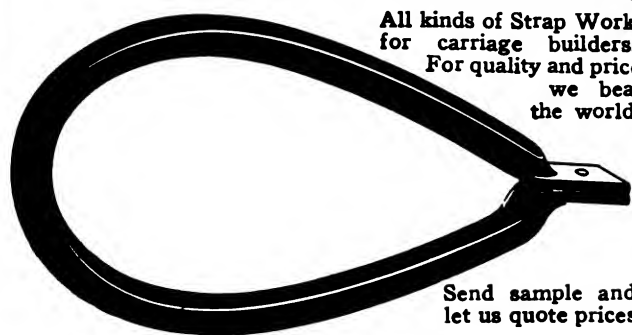


Made with
automatic
stripper if
desired.
Also made
in larger
sizes.

Write for catalogue of
HANDY MACHINERY FOR CARRIAGE AND WAGON SHOPS
MODERN GASOLINE MOTORS, ELECTRIC LIGHTING PLANTS

Bicknell Mfg. & Supply Co.
JANESVILLE, WISCONSIN

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES



All kinds of Strap Work
for carriage builders.
For quality and price
we beat
the world.

Send sample and
let us quote prices

J. C. DECKER

Montgomery Pa.

THE FAIRFIELD RUBBER COMPANY

Manufacturers of

**Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.**

FAIRFIELD,

CONNECTICUT

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



No. 263-N with Nickel Rail.

ARE YOU IN LINE

With the Leaders for 1912?

THEY WILL USE DASH RAILS

Welded Solid To The Dash Frame

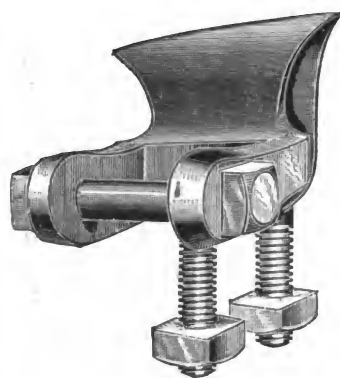
Skewed Shaft Couplings

**Regular or Oval Patterns
For High Arched Axles**

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



All Steel Piano Box Buggy Bodies One Piece Steel Seats

No More
Checks,
Splits,
Corner
Breaks



Patent
Applied For

Write for our illus-
trated catalog show-
ing a number of our
other seats.

Furnished to most any width desired.

Keystone Sheet Metal Co.

Factory, Economy, Pa.

Office, Ambridge, Pa.

The Higgin

LINE OF CARRIAGE TRIMMINGS

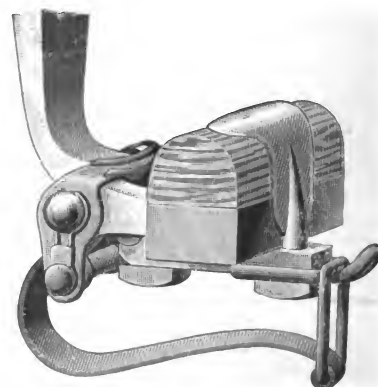
KNOBS



No. 70.



No. 133



(Closed.)
The Higgin Quick Shifter.

KNOBS



No. 72.



No. 130.



Full Leather Nut



No. 74.



Black Japan Nut

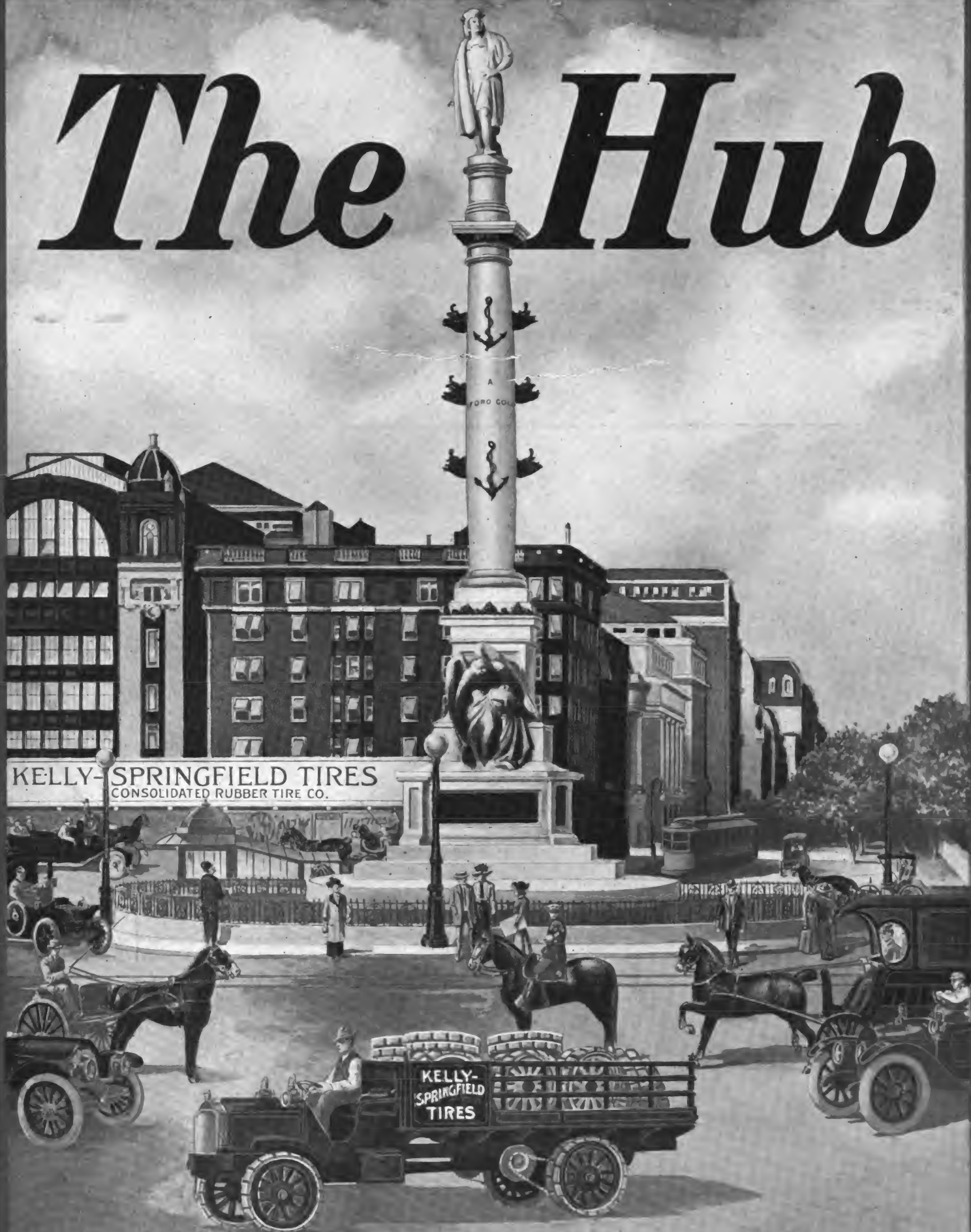
QUALITY UNSURPASSED.

Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co.

Newport, Ky.

The Hub



TRADE NEWS PUBLISHING COMPANY
24-26 MURRAY ST., NEW YORK

Hoopes Bro. & Darlington Inc.

West Chester, Penna., U. S. A.

SARVEN

STAR or KENNY

Sweet Concealed Band

WOOD HUB

WARNER

WHEELS

**HEAVY and LIGHT
for**

CARRIAGES

WAGONS and

TRUCKS

IF YOU WANT THE BEST TRY OURS

JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

Acknowledged the Standard for Fifty Years

AND MANUFACTURERS OF

Fine Carriage and Automobile Varnishes

New York,

Chicago,

Minneapolis,

Kansas City



CRANE & MACMAHON, (INCORPORATED)

8-10 Bridge St., NEW YORK CITY, U. S. A.

Sole Manufacturers and Exporters of the

HICKORY NUT,



ACORN,



and STAR



BRANDS OF

Carriage, Wagon and Automobile Wood Stock

FACTORIES:

ST. MARYS, OHIO.

RICHMOND, VA.

For Export Prices apply to the New York Office.

It Pays To Sell Wagons With Timken Roller Bearing Axles

You really give your customers twice as good a wagon at far less than twice the cost of an ordinary wagon, and this is the best basis you could have for a bigger and more profitable business.

Timken Roller Bearing Axles are adjustable for any and all wear. They reduce draft 50 per cent and they're

Guaranteed for Two Years

Send for Catalog and Price List

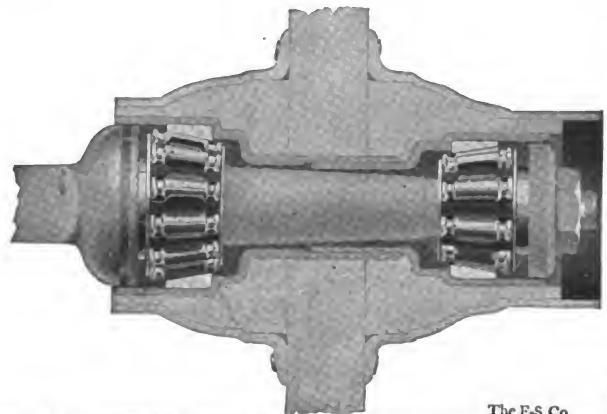
**The Timken Roller Bearing Co.,
CANTON, OHIO**

NOTE—We make Timken Roller Bearings for all automobile applications.

NOTE—Pleasure and Commercial Car Axles and Jack Shafts with TIMKEN ROLLER BEARINGS furnished by the Timken-Detroit Axle Co., Detroit, Mich.

New York Office: 68th and Broadway.

Chicago Office, 1347 S. Michigan Ave..



The F-S Co.

VEHICLE WHEELS OF REAL WORTH



We manufacture Vehicle Wheels of All Kinds; Light and Heavy. Sarven, Warner, Compressed Band and Wood Hub. Send for our Price List.

**THE NEW WAPAKONETA WHEEL COMPANY
WAPAKONETA, OHIO**

Please mention "The Hub" when you write.

A CLINCHER OR A STRAIGHT SIDE CASING ON THE SAME RIM



**Standard
Universal
Rims**
FIT ALL TIRES



THE side rings are removable. On one side they conform to the clincher type tire and on the other to the straight side type. Either tire can be used on the same rim.

A five-rim equipment of STANDARD UNIVERSAL DEMOUNTABLE RIMS is equivalent to two five-rim sets of single piece, clincher and straight side demountable types—demountable so that two turns of a nut locks or unlocks with an independent quick detachable feature. The question of types of tire equipment does not interfere with the sales of the auto manufacturer—all tires fit STANDARD UNIVERSAL RIMS.

The Owner has an unlimited tire field from which to select.

The Tire Makers sell other straight side or clincher tires for the same rim—no changing of rim—just the reversing of the side rings of a STANDARD UNIVERSAL RIM.

Send today for catalogue No. 609 that explains fully.

THE UNITED RIM CO.,

AKRON, OHIO



ASK FOR CATALOG

No. 10. Carriage and Wagon Wheels.

No. 15. Auto and Motor Truck Wheels.

WE HAVE—FOR FORTY YEARS MADE WHEELS OF QUALITY

¶ Our experience should be worth something to you.

¶ To buyers of wheels not already on our list of satisfied customers, we offer our facilities for producing wheels for

**Carriages, Wagons, Automobiles and
Motor Trucks**

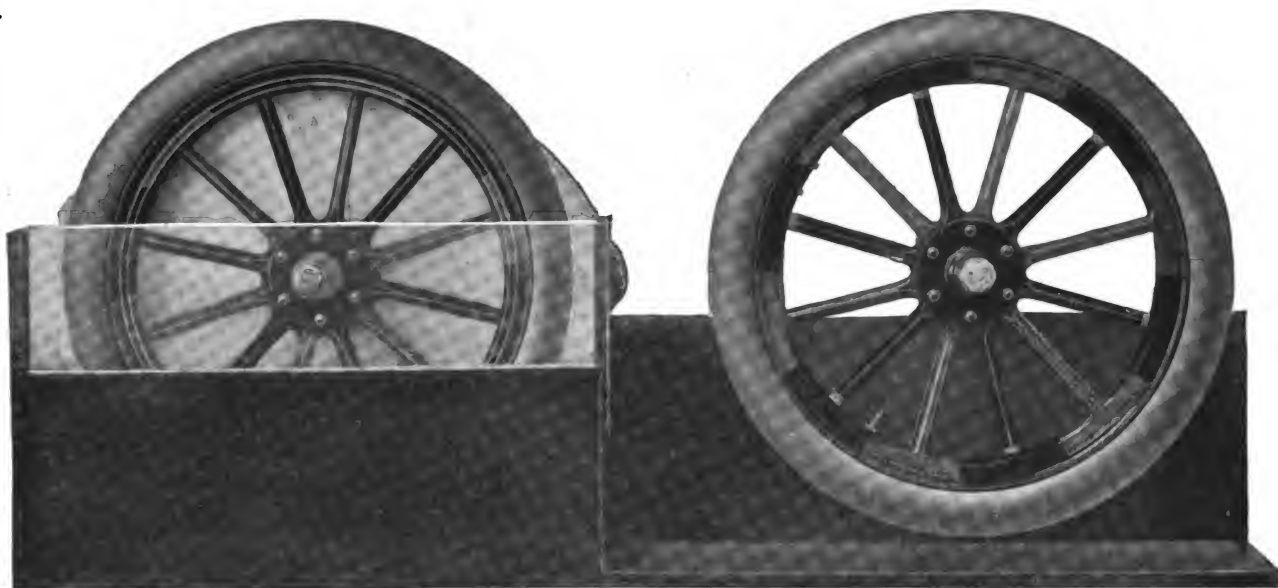
OF THE HIGHEST STANDARD OF QUALITY

STANDARD WHEEL COMPANY
TERRE HAUTE, IND.



Please mention "The Hub" when you write.

The Varnish That Defies Soap



A startling demonstration of a Varnish absolutely unharmed by the caustic action of automobile soap—a feature of our exhibit at the automobile shows this winter.

Very likely you have seen the wheel revolving in the soapy water at our booth and have noted that the finish on half the spokes remained in perfect condition, while that on the remaining spokes lost its lustre before your eyes.

Six of the spokes of the wheel are finished with the best automobile gear varnishes heretofore made. They cannot withstand soap. The other six spokes are finished with

VALENTINE'S VANADIUM CHASSIS FINISHING

These spokes stand up absolutely unharmed after weeks of exposure to soap and water.

Every automobile manufacturer, every dealer, every owner knows, after sad experience, that there has been no finish until now that has not been literally eaten up by soap. The condition of the hood, fenders and all the underparts of every

automobile, after a few months of use is testimony for all the world to see.

VALENTINE & COMPANY'S NEW VARNISH

on a chassis will remain in perfect condition for months after other varnishes have been ruined. Prove this varnish for yourself.

We have prepared small pieces of tin, varnished on one side with one of the best known automobile gear varnishes and on the other side with Vanadium Chassis Finishing Varnish. If this tin is left in a strong solution of soap—say a pound to the gallon—for thirty minutes the old-fashioned gear varnish will lose its lustre. Our Vanadium Chassis Finishing will remain unharmed.

This bath in a strong soap solution is equivalent to a month or more in the garage.

Write for this tin. Just fill out the coupon and we will send it to you at once with attractive descriptive booklets.

VALENTINE & COMPANY

257 Broadway,
New York

343 So. Dearborn St.
Chicago.

74 Pearl Street
Boston.

Name
Address
City
State
Cut off and mail to
Valentine &
Comp'y
V.C.F.

Please mention "The Hub" when you write.

LOOK FOR THIS



Meritas Leather Cloth

Patent Leather and Imitation Rubber Finishes - made in
Muslin, Drill & Duck for Carriage & Automobile Trimmings.

AT YOUR JOBBERS

The "MERITAS" trade mark on the back guaran-
tees perfect quality - *Write for Sample Book*

Standard Oil Cloth Co.

320 Broadway

NEW YORK

The Superiority of

REG. U.S. PAT. OFF.

FABRIKOID

Quickly Recognized
by the
Discriminating Buyers
Attending the
Annual Furniture Exhibitions

For sumptuous appearance and the display of exceptionally high quality of workmanship, Fabrikoid Upholstery surpassed all competitive exhibits.

Such an attainment is conclusive evidence why Fabrikoid should be adopted by every furniture manufacturer.

Its adoption economizes costs, distinguishes your production, influences and convinces dealers and satisfies their exacting customers.

Ask your jobber for samples or
Address Dept. No. 269.

FABRIKOID WORKS, WILMINGTON, DEL.

(Du Pont Powder Co., Owner)

LEATHER

— THAT DON'T CRACK —

That can't be distinguished from machine buffed hide.

That wears as well as expensive leather but costs much less.

Leather with these advantages is **Diefenthaler's** soft and pliable hides, and we guarantee that no oil will come out.

Made specially for carriage and automobile trimmings.

We will send sample hide for your approval without charge.

JOHN V. DIEFENTHALER

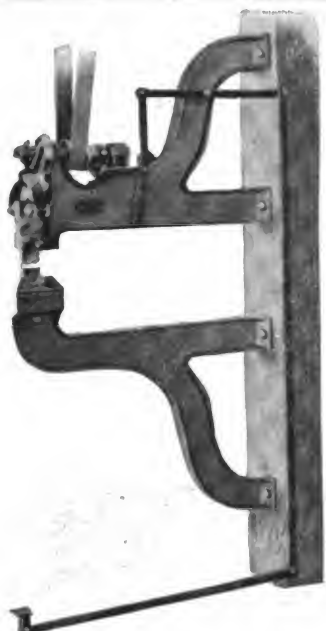
Hamilton, Bruen and McWhorter Sts.
NEWARK, - - NEW JERSEY

Please mention "The Hub" when you write.

METAL BODY MACHINERY

of PETTINGELL PATENTS forms the largest, if not the entire equipment of most every automobile body plant in the United States. This surely denotes superiority of the Pettingell line. These machines are also extensively used to do first class work in getting out body stock and frame work.

WRITE FOR CATALOGUE



NEW AUTOMATIC POWER HAMMER

Designed and made especially for Aluminum or Metal Body Work; gives plenty of room to form or turn body panels, seats, wide backs, etc. Is designed and built to run at a high rate of speed, and the peculiar construction with springs and belts preserves the bearings, pins and screws from racking or breaking.



IMPROVED METAL ROLLER FORMER.

A solid, substantial machine, all metal, with cut gears. Will make any curve or various irregular curves on Mud Guards, Metal Panels, Seats, Etc.



HAND MOULDING OR BEADING FORMER.

Will form moulding or beading any size or shape, cuts all metals, will fold in wire around edge of metal and turn over flanges, etc. Intended for use in factories and shops where small machines are needed for much of the work that can be done quicker and easier than on large power machines, and also for many shops where they have not power or facilities or do not wish to put in the large, powerful and more expensive machines.



POWER MOULDING OR BEADING FORMER

A big improvement over any machines formerly used for forming, beading or moulding; cutting all metals; turning over flanges or folding in wired edge of metal, or any part of the work, and combines three machines in one. Adjustable every way and quickly changed for any work. Designed and built to handle all kinds of metal, aluminum, sheet steel, copper or tin.

THE PETTINGELL MACHINE CO.
AMESBURY, - - - - - MASSACHUSETTS

Please mention "The Hub" when you write.

Attention!

FALL IN LINE

With the many who are actively interested in our

CUT LEATHER PROPOSITION

We are positive a trial order will convince you that to advertise High Quality Leather, with us means to fill your order with the best that money can buy. We know that you will be satisfied in every respect. - - - - -

Our figures will be mailed you promptly on receipt of your inquiry.

M. STRAUS & SONS

OFFICE:- 440 Frelinghuysen Ave.,

NEWARK, N. J.

"BLACK VELVET" CUSHION SPRINGS

Manufactured Only by the

NATIONAL SPRING AND WIRE COMPANY

ALBION, MICH. WINDSOR, ONT.

THE SPRING OF QUALITY.



SPRING or SOFT EDGE CUSHION FRAME

For Buggies or Other Vehicles. Built of the Highest Grade of Steel Wire.



STRIP FOR WOOD OR BOX FRAME



MAYO RADIATORS

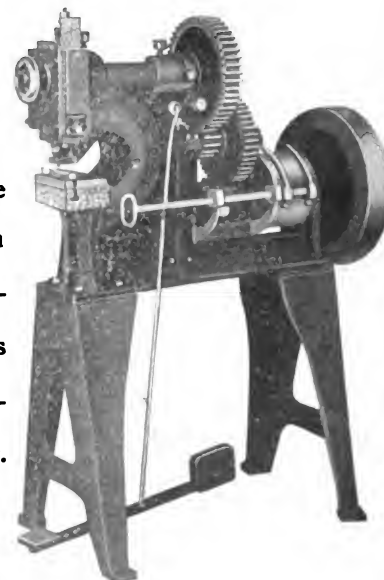
have done their part in making the splendid reputations of America's best known cars.

Can any maker afford to jeopardize his reputation and nullify his good work in other directions for the sake of a few dollars "saved" in the purchasing department?

MAYO RADIATOR CO.
NEW HAVEN, CONN.

BICKNELL'S No. 90-B Punch and Shear

Designed for close work such as punching tires and similar work.



Made with automatic stripper if desired. Also made in larger sizes.

Write for catalogue of
HANDY MACHINERY FOR CARRIAGE AND WAGON SHOPS
MODERN GASOLINE MOTORS, ELECTRIC LIGHTING PLANTS

Bicknell Mfg. & Supply Co.
JANESVILLE, WISCONSIN

The Hub

Copyright, 1911, by the Trade News Publishing Co. of New York.

Entered in the New York Post Office as Second-class Matter.

VOL. LIII.

MARCH, 1912

No. 12

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President. G. A. TANNER, Secretary and Treasurer.
24-26 MURRAY STREET, NEW YORK.

Other Publications of Trade News Publishing Co.:

HARNESS (monthly) per year, \$1.00
AMERICAN HARNESS AND SADDLERY
DIRECTORY (annual) per copy, \$4.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE.—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissière, Paris. Subscription price, 15 francs, postpaid.
GERMANY.—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.
ENGLAND.—Thomas Mattison, "Floriana," Hillside Avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Auto-Car Bodies

A majority of bodies made for automobiles are made of metal. Black sheet steel of the stove pipe kind of metal seems to be popular. It is more easily and quickly fashioned into the wished-for contours than cast aluminum. Besides it is a cheaper medium to work.

It is stated that a maker can turn out a metal body automobile in a week's time, whereas the material for a wood body has to go through many processes of drying, steaming, bending, etc., before it is even ready for the attentions of the body maker, and this last artisan needs time and plenty of it, too, for his creation.

It is easy, then, to appreciate the motives that make the quantity manufacturers turn to the more plastic material, even though their product is not a wear-enduring article in its finished state.

The cost of building pleasure cars has been cheapened very much indeed. It has been stated, we do not know with what truth, that this cost is not more than half of the customer's price. The selling cost is still a great item. This is apparent to anyone who takes notice of the extravagantly appointed repositories, the beau ideal salesmen, the sales managers, sub-assistant dittoes, with liveried pages and porters to see that the cigarette supply is kept constant and the front doors kept ajar for the

wished-for buyer. Even the button-hole bouquet supply is an item of cost.

The expenditures for publicity have been unequalled in the history of the promotion of any business whatever, and the cost as extravagant as an Arabian Nights story. The buyer pays the freight.

Until some of these conditions change, the automobile will be, according to price asked, more or less meretricious as an article of wear and worth.

An interesting comparison is the old-time brougham or rockaway wood body, enduring like the moral principles of a saint, and the metal body that might well exclaim: If so soon I am done for, I wonder what I was begun for.

The automobile-making industry has become a marvel for turning out work in fast time. When the details are considered, an idea of the swiftness is had when it is known that they are turned out as quickly as the very much less complicated wholesale buggy. This is going some; and how can it be done without sacrificing worth?

We think a change is coming in these methods. It will be either as a large concession in price, or a great advance in the worth of the article, together with a big slump in the selling cost. A year or two of bad general trade conditions will help along the reform amazingly.

The motor car is such a desired advance in vehicular propulsion that it must soon settle down to supplying a demand that is no longer forced by hot-house methods of business. Then we will begin to see some fine examples of worthy work in materials of the greatest longevity, and the "model" period will be forgotten as one luscious, but iridescent dream, like the "days of '49."

That will be a fine day for the industry, we believe.

The Education of the Motor-Buying Public

If the man who has realized on his mortgage and is ready to enter the market as presumptive purchaser of a car is not very well informed as to the various defects of many cars, it is because he has not diligently studied the advertisements of the makers of the cars. These announcements are text-books carrying the most complete information given out through the auspices of those who ought to know.

One maker says, "if you are familiar with the inaccessibility of the cars of earlier design you will be impressed with the little improvement that has since been made." He states, too, that there are a thousand parts on most cars that are unnecessary. This must give the buyer

parse, and make him wonder what he will do with so much that is superfluous, if he should happen to be the one stung. Then this homely bit of advice is a part of the next lesson: Get in touch with a few of the owners of those cars and you can pretty quickly learn the facts you should know!

A rival and friendly maker says of another car that it is "tinny," but the retort is also to the point, which is that the tinny car weighs only sixty pounds to the horsepower, and if excessive weight is such a fine thing in a car why do not those who have it advertise the fact as a feature.

We have always held the belief that the automobile salesman was a gentleman of the most sensitive veracity, but yet another maker advertises the tip that it is easy for you to learn what any car has done, so that this year you need not depend on a salesman's say-so.

Says another, that with the exception of the one under consideration, of course, while wheel bases are longer, cars, meaning the motors, are still practically as they were three years ago. My! but this is confusing, with the industry going ahead by leaps and bounds.

And now comes the sleeve motor to complicate the situation. If what is said about its excellence is also true as the salesman's say-so, then it is a candidate for the scrap pile, but on the other hand if the sleeve motor is the shadow of the coming event, the contact valve motors are simply antiques fit only to rattle about a museum as metallic curios. Before coming to a conclusion on this important subject we will scan still more the advertisements in the daily prints.

When the confused buyer gets ready to unbelt he may put in his specifications something like the following: "A limousine-bodied, shaft-driven, self-starting, open-hearthed, southern-exposed, fore-doored, hip-supporting, base-burning, sixty-six, turned out of a factory that has been giving the world the most economical peanut-roasters for seventy-five years, by a firm whose financial responsibility is known from pillar to post."

We can't recall that we used to see that hungry kind of advertising in the years gone by, hence we are driven to the conclusion that the makers just want to educate the public so that the buyer will pause long enough to allow the maker to catch up with the belated orders!

A Fool and His Folly

Thus this journal pays the compliment of its consideration to the acts of publishers of many class and trade journals who are subjects of the "publicity bureau" habit so persistently injected by the "manager of sales" or "manager publicity department" that has become such a fad and fancy among manufacturers.

The advertising rates of a journal should prove a protective tariff that would exclude the major portion of this duplicated free puffery, but with that expectation which may be called a lively sense of favors to come, and that do not come, the publisher "runs" the trash, and waits to hear the crisp contract rustle onto his desk.

The news (!) is usually proffered with a vague impli-

cation that soon it will be the turn of that particular journal to be favored (?) with an advertising contract.

That such a foolish publisher "looks good" to these young gentlemen, graduates from some Ad. Club, or Scrivener's Scavenging Society, is plain, but to make it still plainer to the myopic misfits who publish some trade journals, it gives us pleasure to quote one of them. He says: "We find plenty of 'suckers' who will run our press notices, oftentimes when we have no advertising contracts with the publishers, who hope to get them later. What's the use of buying advertising when we can get it for nothing? If one notice in ten I send out is published we are a good many dollars ahead."

Still another one of these press bureau confidence men said his department had reduced advertising expenditures fifty per cent. and secured a largely increased number of inquiries per dollar expended for advertising.

Fine! Speaking jesuistically the end justifies the means, but it confuses us with impotent shame to think that the publisher of a journal should be looked at in the light of a mere "come on," ripe and ready for the wiles of the advertising confidence man.

It is a long hark back to the days of Dr. Johnson and Grub street, but those stained and whiskered-trouser wights did get a penny-a-line for the facilities they had to offer, while the publisher of a trade journal today, full of pretension about "leading" and "influence" and other sooth-saying phrases, permits himself to be worked as if he were mere potter's clay in the hands of these sculptors of sops, many of whom are yet in swaddling clothes. It places the publishers in the kind of light that calls for a slow curtain and soft music.

It would be a nice thing to be able to say with truthfulness that it is only among second and third rate publishers, issuing journals of the same calibre, that the wiles of the publicity pirates succeed, but we have seen evidence quite to the contrary. Even the New York daily journals are not immune. It is just overpoweringly surprising to see how bald assurance can score at times.

Does it pay, after all? The lead has been worked to its lowest levels, we should suppose, and the reaction when it comes, will be drastic, and in some instances, unfair, but the sower will get what is to be reaped.

But this is not our point. We are thinking of the publisher and wondering when a fool will tumble to his folly.

Spokesman and C. B. N. A.

In the January issue of *The Spokesman*, someone rolled a pill for the editor, and he dreamed a dream. He seems to think that he is the wet-nurse (by self appointment) of the C. B. N. A., which, we read, "has not kept pace with the times, and has lagged in the rear serenely content to maintain its organization." So the journal tells the members "it should have launched out into a vigorous campaign of publicity" (which is easy without funds) "showing the world that the manufacturers of horse-drawn vehicles were prepared to look out for themselves." There should have been "universal co-operation on the

part of every manufacturer of vehicles, and above all each concern so qualified should have been enrolled as a member."

But, no! not even such a jumble of meaningless words could inspire them so the bidder "squatted down on his marrow bones, and took a peek at the situation, gave a yelp of despair, and with tail between legs, "went off somewhere to "bemoan the ingratitude of mankind," which ingratitude made itself manifest by buying about the regular yearly quota of factory-built buggies.

The Spokesman's veiled prophet says "it is true the automobile industry, perhaps, had better timber in its ranks," but the C. B. N. A. should have "seen the handwriting on the wall, and entered into the spirit of the times, striving to increase its membership and supplying logical reasons for its existence." But a sound has been heard, something heavy like a drop of ink from the pen of the editor has fallen and spluttered, and the organization means to do something besides "listen to long papers, resolutions and perfunctory addresses . . . it will extricate itself from the ruts into which (sic) it has been traveling." To help matters along "the president" (already having made good with a page adv.) "and directors and secretary have resolved to go after things with hammer and tongs."

There is much more which makes claim to the languid attention now that a "resurrection is taking place and the old C. B. N. A. is emerging from its sepulchre," and a lot of mixed metaphor also emerging from its sepulchre, where it ought decently to have remained!

We would not have supposed that printing a convention daily report merely to more widely broadcast "long papers, resolutions and perfunctory addresses" could have so stirred the ardor of our contemporary. When he calms down and depends more on the record of fact and less on his imagination for his inspiration he will awake from the dream and the effect of the pill will wear away. When he relapses into this quieter mood perhaps it will be worth while to point out how nonsensical his expressed views are—but not yet, we will wait until the effect of his frenzy has vanished and the laughter of the trade has been discretely dissimulated under the guise of a make-believe yawn. The Spokesman editor is a nice fellow and means well; we like him, or it would not be worth while to at all mention his diatribe, for such it really is.

We are going to render friend Hucheson a personal service, too, because we like to see editors give evidence of literary training as well as ability to write sense. It pains us to note slips of expression found only in the writing of the illiterate. For example, nobody intending to fight could "meet this new competition . . . with visor up and lance couchant" unless he intended to be soundly wallopped, because the knight went to the joust with visor down and lance couched, not "couchant," which is heraldry for resting, crouching, lying down. To describe one as "squatting on his marrow bones" is just as accurate as the "rocks of Gibraltar," which is a new geographical discovery in the Spokesman. We despair of what follows: "here is where it needed someone to roll away

the stone and reveal to the world that in the organization the industry had a sentinel which (sic) never went to sleep on the watchtower," etc. At this point the pill was working with fell effect. Fancy the attitude of the editor, for example, rolling away the stone to reveal the sentinel on the tower "which" never went to sleep! And why should our enlightened friend say that the "carriage people have always prided themselves on their conservativeness" when there are such good public night schools in Cincinnati with opportunities free to all. Also our brother speaks of the "patronage . . . which faded away like a mist before the noon-day sun," yet this powerful mist was able-bodied enough to "shift the carriage center." Whoever heard tell of such wonders of fine writing outside of the Spokesman and the Arabian Nights. "Touchin' on and apertainin' to" the carriage builder he is told to "rejuvenate by beginning on himself"; how else could he? After he has done this he can see the changes that "have transpired during his long sleep." How really foolish he might feel if he only knew something about the meaning of words. To think of telling the trade to note the changes that have perspired or sweated (that is all transpire means) during his long sleep.

"Wake up," also, friend Huch. and think before you write, so that it may come to pass that what you say can be translated into common sense.

Concrete Floors.

There has been enough elapsed time for the demerits of concrete floors to become subjects of remark. The dust is a trouble, and the unyielding surface is complained of as being hard on workers. We think rubberheel shoes might be a remedy in the latter case. How to avoid the grinding of the surface and the dust is not so easy to determine.

Good Advice.

We have found what we are going to quote in some journal unidentified, but it is a very good thought, that might keep a man engaged all Sunday thinking about its Monday application:

Get in touch with those who are interested in your line of work. Discuss the best methods of performing intricate and difficult work. Apply the simple little devices that eliminate handlings of work and stock through the factory. Train yourself to think success and cultivate your thinking power about the countless little problems that confront you in the course of a day's work. Perhaps the way you solved the last one is the very way some of us are sitting up nights scratching our heads trying to find out.

POLISHES FOR BRASS.

For cleaning hot brass cylinder heads and jackets, try the following recipe, which a correspondent of the Practical Engineer says works fine: Sift coal ashes fine and mix with kerosene oil to a thick paste; add as much air-slaked lime as can be conveniently mixed with it. Apply this polish to the bright parts, rubbing hard; wipe off and polish with dry slaked lime. Whiting and ammonia mixed to a paste is another good polish for brass. Apply and rub dry.

Foreign Motor Body Designing

Striking Exhibits of the Trend of Best Foreign Styles Gathered by
The Hub's English Representative, Mr. Thomas Mattison, at Olympia.

[Concluded]

Messrs. Thrupp & Maberly, of Oxford street, London, who were established in 1760, showed a fine collection of cars, four of which we reproduce from photos. This old and eminent firm is by appointment coachbuilder to the English court, and was the first firm of carriage builders to turn its attention to motor carriage building on its practical introduction into England in 1896. This is characteristic of such a firm, which had at its head the late G. A. Thrupp, the gifted author of the "History of Coaches," and an ardent technical educationalist.

The four cars herewith are all of heavy caliber and their lines traced to throw off a massive impress, as well as a pleasing harmony.

No. 22 is a cabriolet on Hotchkiss chassis. The lines of the body are firm and upstanding, which gives a strong solidity to the vehicle. The back quarter is cut to harmonize with the wing line, the moulding running snugly into the corner pillar. The corner of the body is rounding and plain cane paneled to harmonize with the waist belt of the door. The controlling line is finely serpentine into the bottomside. The front quarter is cabriolated, and fashioned with belt panel to cut it up, and to give a deeper line to the door. All the lines vanish on the bottomside without any trace of abruptness, a very important thing to work out in design. The head is half-hooded and canopied as well. The body is level sided and makes a smart and high class piece of work whether closed or opened out.

The other exhibits of the firm are: No. 23, a limousine on Rolls-Royce chassis. The body has a very large back quarter light, which is most necessary on this class of motor. The belt line is continued to the front door top, while the front beating is twin shaped for individual seating. No. 24 shows a three-quarter landaulette, on the same lines as the limousine, but with the belt line finishing with elbow curve on the back pillar. No. 25 shows a three-quarter landaulette on Benz chassis. The body is the same as No. 24, but with cabriolet front quarter after the style of No. 22. It is needless to say that this firm's exhibits leave nothing to be added to them in the way of workmanship, design and finish, which are of the highest, and uphold the best traditions of English coach building.

Messrs. Hooper, coachbuilders to H. M., the King, and to most of the courts of Europe, have been established over a hundred years and showed a fine collection of their limousine landaulette cars on varied and exclusive lines.

No. 26 shows a limousine landaulette of light and graceful design. The body has cabriolet quarters, which are finely proportioned by the controlling lines. It is a car that will yield all the room and comfort within its proportions without unduly increasing capacity, a very important factor in motor body construction.

The body seats four inside, all facing forward, it has round corners, and two to the driving seat. The painting was of dark blue, picked out white. The interior trimming was of special motor car cloth (west of England). The body was mounted on Sheffield Simplex chassis of 45 h.p.

No. 27 shows a limousine landaulette on Delahaye chassis. This body seats four inside all facing forward. It has round corners, and deep doors to the driving seat. The painting was of blue, picked out primrose, and the interior trimmed with gray velveteen.

No. 28 shows limousine landaulette on Charron chassis. This body is similar to that built recently by Hooper & Co. for H. R. H., the Duke of Connaught's use in Canada. It seats four inside, the two folding seats being arranged to turn up against the front inside of the body. It has deep doors to the driving seat. The painting was of deep ultra-marine blue, picked out black. The interior of the body is trimmed in gray cloth.

These designs of Messrs. Hooper, though dealing with one type of body, all show a very live difference in the apportionment of surfaces, and in the blending of lines, but in all this variation the main thing evolved is that each design shows itself conspicuously to be a "Hooper body." It is not the work that lives, but the art.

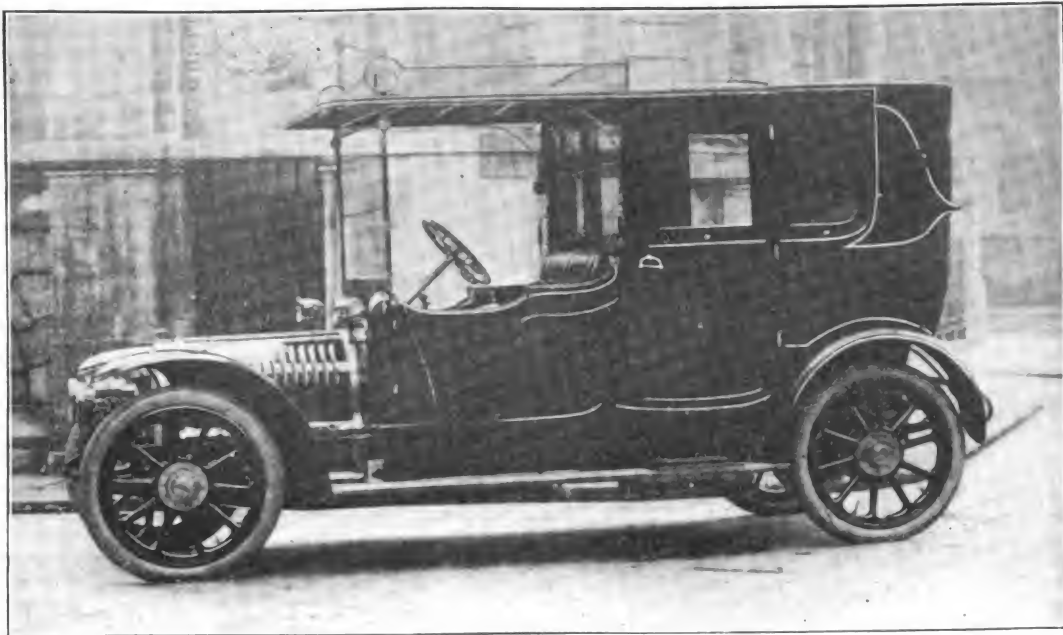
Messrs. Mulliner, of Long Acre, London, and Northampton, are a very old established carriage building firm, and a household name in English coachbuilding. They are distinguished high class carriage builders, their products possessing that striking exclusiveness and signal individuality so characteristic of the creators of form, and sterling quality. The Mulliner family has a long record as carriage builders, having been established well over one hundred years. This firm was one of the first to lay hands on the new comer, the motor carriage, which was to shatter to a wreck the old English carriage building industry. Messrs. Mulliner are now one of the leading motor body designers and builders in English manufacture.

A LONG AGO FORECAST

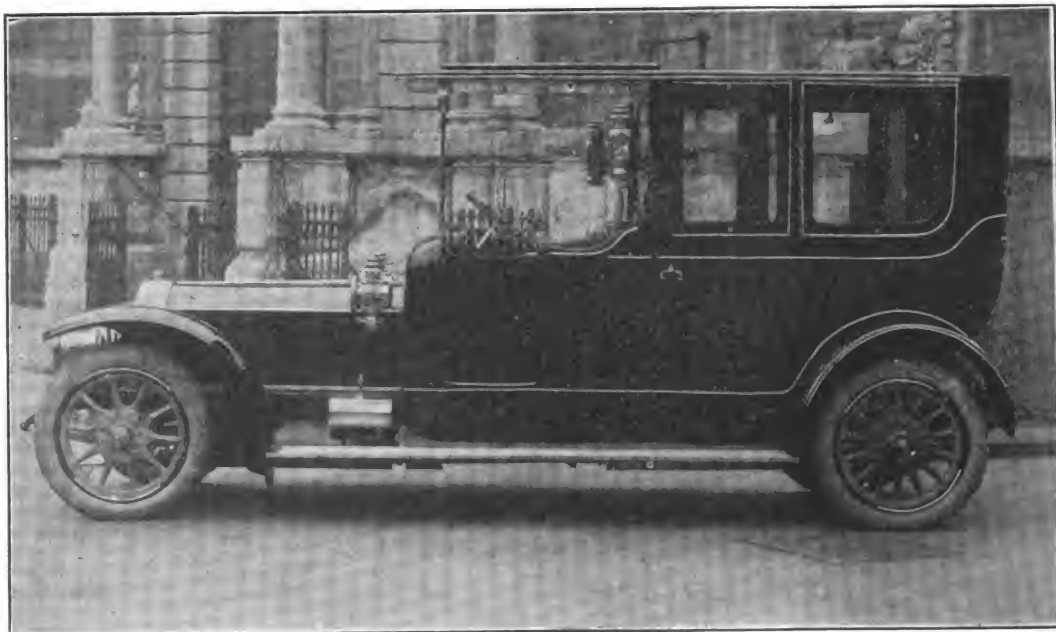
The following from the Hub News of August, 1892, makes interesting reading at the present time:

A novelty in the way of a wagon propelled by electricity was seen on the streets of Chicago August 9. Some time ago President J. B. McDonald, of the American Battery Company, purchased several patents from William Morrison, of Des Moines. Among other things was a *par* wagon equipped with a small three-horsepower motor and a twenty-four cell storage battery.

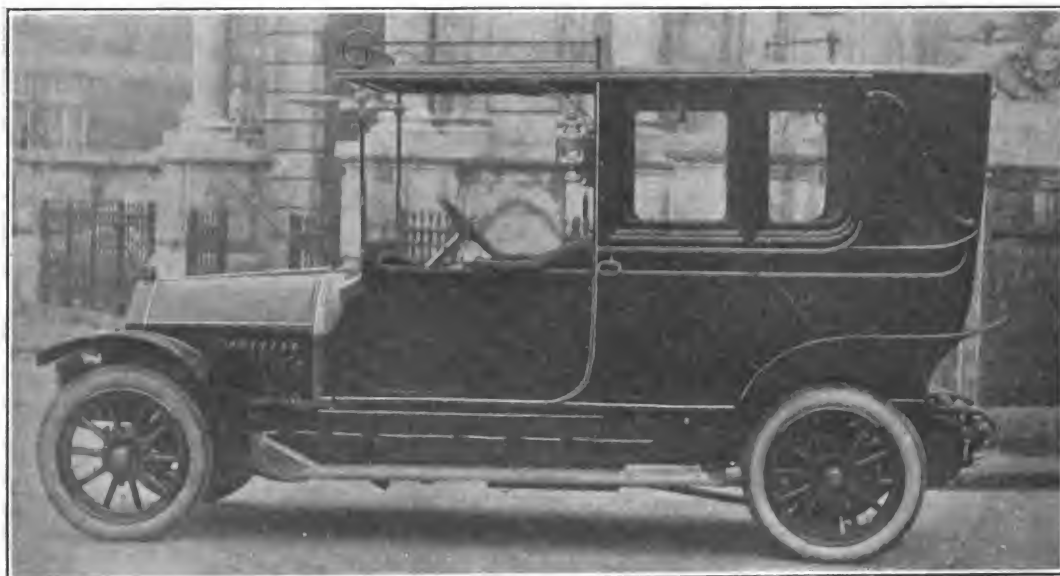
With five persons in the wagon it traveled by the way of Winchester Ave. to Jackson Boulevard, to LaSalle St., to the company's office at Monroe and LaSalle. The run was made in twenty-two minutes, which was very satisfactory, considering that the wagon was delayed at the bridge, and that frequent stops were made on account of the crowds. The peculiarly propelled carriage attracted attention all along its route. As it passed through LaSalle St. a crowd followed it and surrounded it, and caused it to stop. It is calculated that the wagon can make ten miles an hour easily with a present motor, and can climb any hill in Chicago.



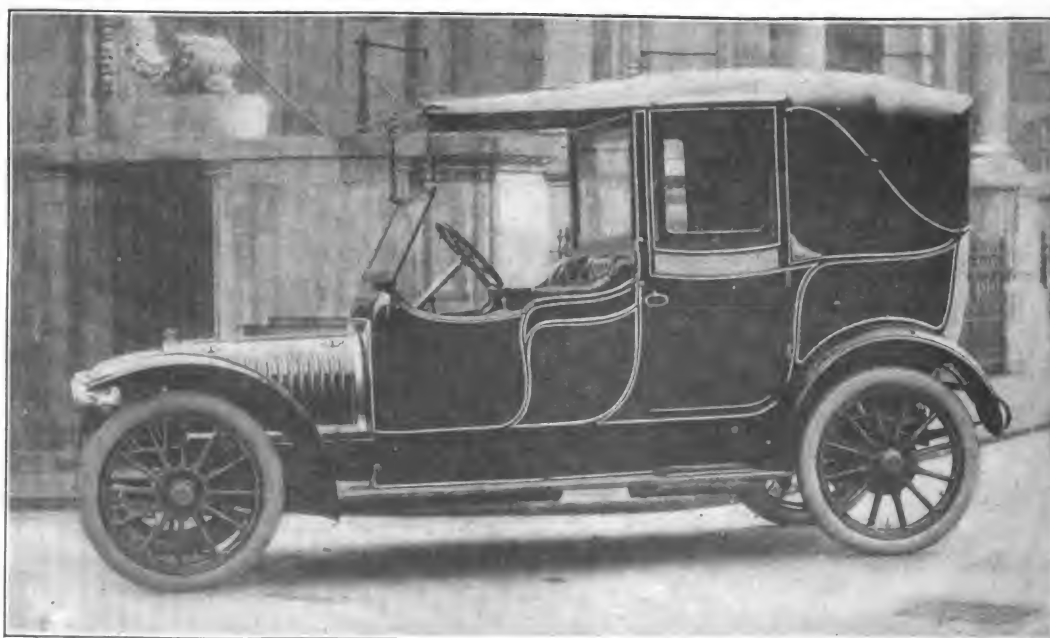
No. 22—CABRIOLET
MESSRS. SHRUPP & MABERLY,
London, Eng.



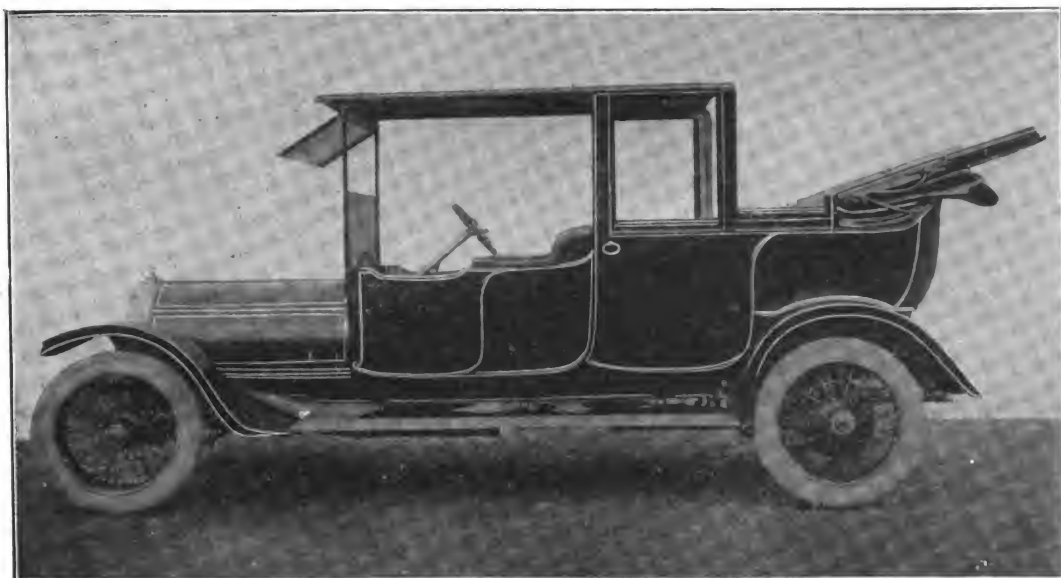
No. 23—LIMOUSINE
MESSRS. HOOPER,
London, Eng.



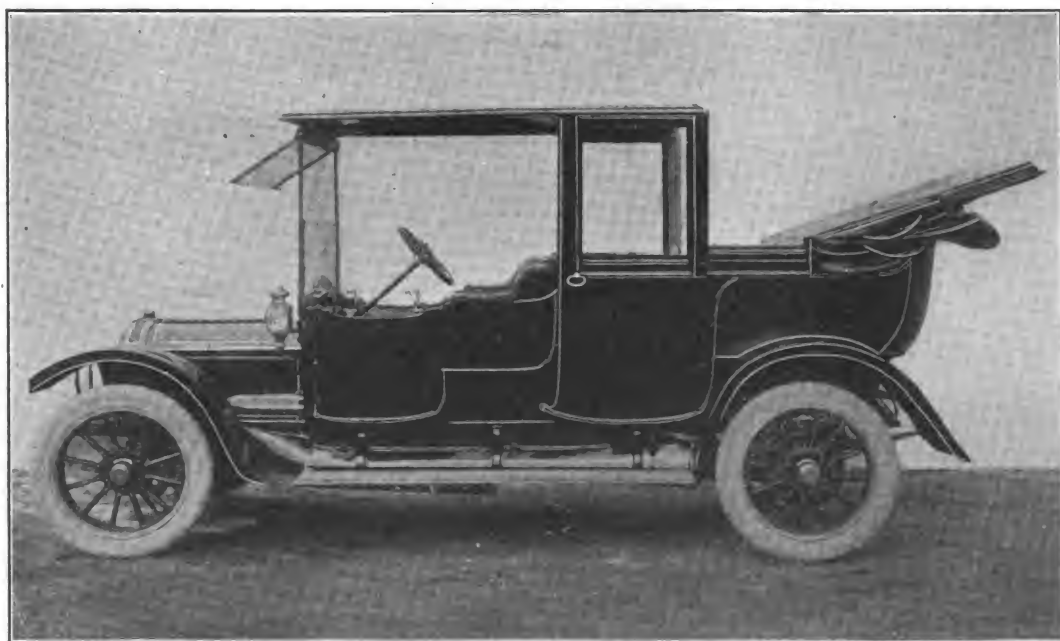
No. 24—THREE-QUARTER LANDAULETTE
MESSRS. HOOPER,
London, Eng.



No. 25—THREE-QUARTER LANDAULETTE
MESSRS. HOOPER,
London, Eng.



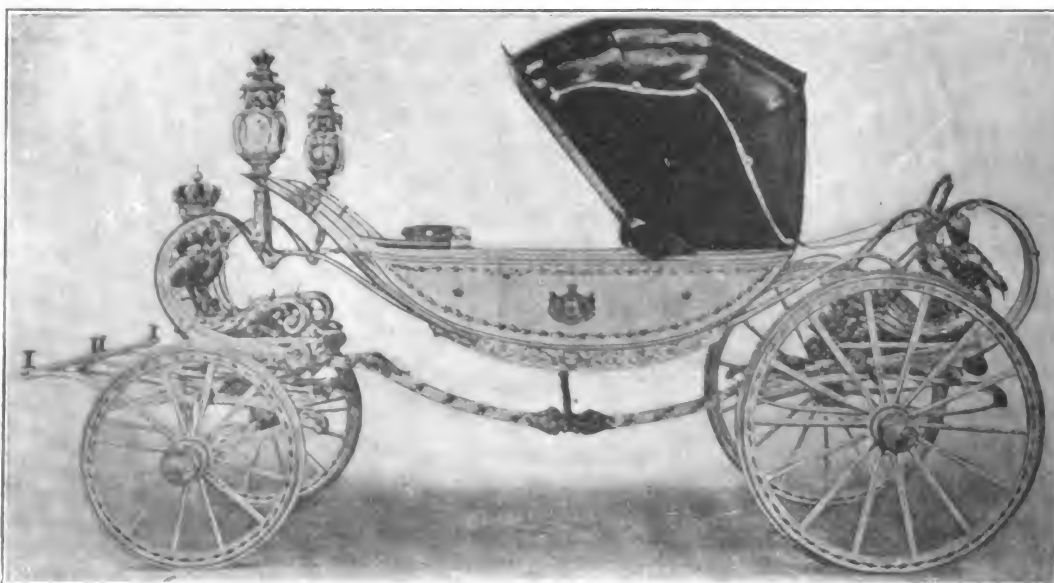
No. 26—LIMOUSINE LANDAULETTE
HOOPER & CO.,
London, Eng.



No. 27—LIMOUSINE LANDAULETTE
HOOPER & CO.,
London, Eng.



No. 28—LIMOUSINE LANDAULETTE
HOOPER & CO.,
London, Eng.



GALA CARRAIGE OF THE QUEEN OF HOLLAND.

BODY STYLES

The foreign styles and tendencies are clearly epitomized in what follows, and may give a line on what is most in favor. We quote from *Automobile & Carriage Builders' Journal*.

The brougham, either as a single or double body, is not considered a car which will sell. The business in private bodies of this pattern is almost at a standstill.

The double landaulette seems to be having a new lease of life. It would appear that the beauty of the front curved glass and the attendant ingeniously arranged contours below have an attraction.

The D-fronted landaulette naturally demands a big wheel-base, but the motor manufacturer is still very generous in this direction. The D-fronted limousine landaulette is also to be seen, and generously proportioned bodies of these types were on view where the engine position is not allowed to triumph over the wheelbase. So far, these two particular varieties of bodies do not seem to have succumbed to the general demand for flush-sided bodies.

The protected phaeton still lingers on in the shape of cabriolets, limousines, and other types of close bodies in which the pillar types hinge and fasten parallel with the cant rail. The folded pillar top, whether it be lying above with the cant rail, in full view of the side or cross fence rail, or hanging down reversed inside the body (where it is liable to come in contact with the feet or the shins of the passenger), is not a thing of beauty, and we look forward to the time when further ingenuity will be displayed in hiding these parts of the framework more successfully, or redesigning them so that these are more harmonious with the surrounding bodywork when folded. The fact that pillar tops, when not in use, are an eyesore, has often been recognized, and one may still find bodies where they are made to detach and put away in a handy locker, the high-class builder also appreciating the fact that they should be stowed away with care, by providing specially shaped and padded clips in the locker for their reception.

The landau has again been revived, modern tendencies showing themselves in that the corners of the body are rounded in place of the usual molding formed in the corner pillar and bottom side. Although the landau may be considered old fashioned, yet it must be admitted that it provides the simplest folding head mechanism for covering a pair of seats. The main disadvantage—that is, the overhang of the front part of the head when down—can be lessened by introducing new types of hinge combinations, as used on cabriolets. The driving seat, it would appear, must go unprotected; but as a landau is essentially one that will be driven by a chauffeur, and confined to town use, this matter is of little moment.

The cabriolet is still in great demand. The head mechanisms used in 1909 and 1910 have not by any means been superseded, and improvements, where made, were in the nature of a better control of the folding of the hind part of the covering, while the canopy had still to be reckoned with in some cases. The collapsing of a leather canopy is still sufficiently troublesome to keep the inventor's attention directed towards it, for, after pushing in the side rods, one has to deftly push the leather upward, fold it neatly on the roof of the portion not yet collapsed, and then roll it up and strap it to the front rail.

The problem of the landaulette, phaeton, or cabriolet is much simplified if the normal number of doors is reduced. One well known firm has been successful during the past year with a pattern which has only one door on each side, and also one with only side door, the off side being quite innocent of any means of entry. Another pattern on similar lines had no side-light pillar top, the edge of small leather quarter being tucked behind a brass edging of the glass frame, and the hind part of the hood being supported mainly by a long horizontal stick, and sliding downwards, when required to open the hood, something after the style of an extension stick of a cape cart hood.

The most sensible variety of body—that is, the most useful,

best wearing, and having the least disadvantages—is the limousine. Its great practicability is still admitted by many, and it lends itself to the most symmetrical outline; there is more room for novel arrangements, be it a question of outline, seating arrangements, or interior lavish display.

The sliding roof is again to be seen this year. This method of ventilation has the advantage that it does away with draught and dust, which is not always the case when the motorist seeks for fresh air by lowering the lights. We were glad to note that the suggestion made in Mr. Austin's paper, read before the Institute of British Carriage Manufacturers the month before last, has been put into practical shape by its author.

The extra seats were arranged behind, and not in front, of the main seat, so that not only was the doorway left free, but, in the event of the body being only used by two persons, they had the additional comfort of riding on a seat well placed with regard to the hind axle. These extra seats were placed wagonette fashion, and reached by a single hind door and folding step, while a curtain could be drawn behind the main seat when the rear portion was not in use.

The limousine landaulette is still a very popular type of body, and is a far greater favorite than the cabriolet, as it gives the same accommodation with less complication and expense, although, unless it has a domed roof, the owner does not consider it a self-driving carriage. It is of interest to remark here that in America the cabriolet is practically unknown, and where such types have been imported they have not stood well the rough usage of the bad roads. The limousine landaulette is shown both as a flush-sided body and with the ordinary arrangement of panelling and recessing, and there is a tendency for a small narrow panel to be worked into the corner framing. More bodies are shown in which outside joints are dispensed with, and the endeavor to make these bodies more like a limousine is illustrated by the fact that wooden roofs are used. This kind of roof gives a very neat folding head, and is specially suitable with a flush-sided body in order to maintain the neat character of the body throughout.

In single enclosed cars the design of the wind screen could be used independently of the front pillars. This was done by placing the front stanchions on the front face of the pillar. One body has the lower half of the shield to drop by allowing it to hang on the glass strings when down, another has the top half of the frame to take out if required, while a neat method of working the top half when it is attached to the body is to work it from a central control.

The large enclosed car, with any number of doors from one to five, is to be seen in many styles. An improvement in the arrangement of the front seats, when they do not slide, is for the near-side one to hinge bodily on its back near-side corner, a much better device than hinging the back rest and seat to fold on one another. Some of these bodies have very large side lights, which require careful treatment if they are to work in their grooves sweetly, while the large doors fitted to others need robust hinges and framework to ensure their proper working. Some of these bodies, of course, might well be classified under that somewhat loose term "cabriolets," but there were several, generally referred to as "pullmans," where there was no folding upper structure. As with the limousines, many of these bodies have elliptical-shaped roof and roof ventilators.

Trimming design shows improvement, and more consideration given to the real comfort of the motorist rather than merely pleasing the eye with an elaborate display of laces, polished woodwork, and other fittings. Most of the cushions are adequately sloped. Polished woodwork is still in favor, but there is very little fresh ingenuity displayed here, except that the schemes are more in harmony with the color of the cloth or leather used, and simpler in treatment. The use of a polished half-round fillet to the top of the door rails and round the edge of the scuttle is on the increase. In closed bodies there

are more polished roofs shown. Corduroys and silk tabarettas are used in some closed cars.

There are a few more new varieties in folding seats, and the tendency is to give a universal position with the least number of parts. The pattern which may be transferred from the side to the front of the body is still in favor, and, may be, in the future it will be possible to give a little more slope to the seats, and make them a little wider, so that even the occasional seats will be a little more comfortable.

The frameless light has moved a step further towards perfection. One of the simplest devices is the brass run in one piece from door top to door bottom, and fastened only at these points, so that, by reason of its natural flexibility, by means of the brass angle attached to the bottom of the light, to lift it over the fence without a division in the run. Glass lifts in some cases are still attached direct to the glass, while in other instances the string is attached by a plate instead of fastening it to a metal staple. The control of the frame by means of a side handle and cam plate is again to be seen. The ordinary polished wood frame is still shown to be popular, although brass and new colored woods are used.

The glass frame carrier has been slightly improved by the use of an additional small shoulder to the outer side of the carrier, in order to ensure that it shall not pass the square line after repeated use.

Bevelled glass is still used sparingly, but the use of wired glass does not increase in favor.

The usual silk blinds are as prevalent as ever. With some of the cabriolet head mechanism the blinds are apt to be a nuisance when folding the head.

Apart from roof and scuttle ventilation, the stiles of the lights are in many cases fitted with neat ventilators.

Pockets are still in vogue, probably because the average motorist is very fond of them as a handy place to stow any small article away without having to undo the door of a cabinet. The design of the modern luxurious motor body is largely made up of the study of how to avoid trifling inconveniences.

The metal wing still holds its sway. Most of the wings are made of steel with the usual swaged molding and flanged edging to the front wings, and to the hind ones also if a small car. Dome-shaped wings of various patterns are shown in great numbers. The aluminum wing could easily be recognized by the presence of rivets holding on the flanges. One builder is able to mount his wings without any bolt heads showing on the top surface by welding on a piece of angle plate to the under surface of the wing by means of the oxy-acetylene process. To this angle the wing stay is bolted, from which it could be unfastened when the occasion demanded.

More detachable wings are seen, and an innovation, so far as the motor car world is concerned, is the fitting of the cycle type of mudguard, in which a very close dome-shaped wing is supported by a triple-armed stay direct from the axle, the same principle being adopted in front as well.

The long side step is now used to all varieties of bodies, both large and small, and it was only here and there that a single tread was used. The step board is now usually covered with the several varieties of aluminum matting, the use of rubber matting being seen in a less number of cases than formerly. The cheaper class of body is often finished with beading to the edges of the steps in place of the usual angle plate, and the use of the step as the lid of a locker or lockers is still in favor, likewise the use of one or two zinc dishes for the reception of the spare rims or wheels.

The metal guard between the step and the chassis is a keen rival to the one of leather.

Metal side shields to the wings are practically universal.

The Continental fashion seems to be growing in favor of placing the tool box half-way through the step so as to be

less obtrusive. The tool box is usually polished, and seldom painted to match the body.

Every hue of color is to be seen. The blue or French grey is not so prevalent, more attention being given to the truer mixture of black and white. More cars are painted in pleasant warm browns, while a new color is a special purple. Bright blues and greens are also to be seen, various shades of light browns, mouse colors, stone colors, elephant greys, khaki, and so on. More bodies are shown with moldings of a darker shade than the surrounding panels, and fine lines are often omitted altogether.

The black parts, as used in the decoration of a horse-drawn carriage, are still to be seen on most of the closed bodies shown, but, where a darker shade of the main panel colors is used to form a contrast, the effect is pleasing.

Not so much striping as on former occasions, and seldom is the bonnet painted a different color to the body. Usually the wings were a black in a closed body, and follow the color of the body in an open car.

Sham caning, both as a sheet stuck to the panel, or transferred, is seen on several bodies, but no one seems to have thought of sham basket-work. Belt panels often painted in a lighter color than the rest of the panelling, both in open and closed cars; but it requires good taste in order to carry out such a scheme, and not mar the dignity of the body.

Perhaps the most noticeable feature in the matter of wind screens is the more extended use of side wings to the front and rear wind shield. The single screen is still to be seen, largely adopted for open cars, which, in some instances, are provided with a fancy shaped light below the centre of the joints' working line, and conforming at its bottom line with the shape of the scuttle dash. Metal frames are growing in popularity.

Wind shields still continue to be finished in either brass or nickel.

The "one man" hood is well to the front. The motorist now looks upon it as a matter of course, and the motor body builder is liable to be considered behind the times by his client if he is found fitting five-stick cape cart hoods with a long and unwieldy arrangement of outside joints. These new and ingenious hoods have the advantage that usually they have the finger plates and other mechanism screwed on the inside, so that the whole looks very neat when down. The system of back straps between the back stick and the top back rail of the body is well designed, and gives quite a military touch to this part of the car. Even on cars having less pretentious hoods, the use of outside joints is on the decline.

Although the black leather hood does not seem to make much headway, there are dark-colored hoods used in imitation leather. Leather for landaulette and other heads is now provided with cloth attached on the inside.

A WAY OF HANDLING LUMBER

When lumber is unloaded from the cars, decide whether it is seasoned enough to go direct to the kiln or will have to be stuck in yard. Number piles in yard from one on up, the number being nailed on the foundation so that it can be easily seen. Keep a record showing the kind of lumber, the probable age of the lumber, the date when stuck in the yard, the number of the pile and the length of lumber. When filling one of the kilns it is a very simple matter to pick out the length of lumber wanted, and also the oldest and most seasoned.

Keep a record of the kilns showing kind of lumber, the length, and also the date when it was put in. This record can be kept on a slate, and when a car is taken out of the kiln it is a very simple matter to erase the record of it, and, when refilling, to fill it in again.

Hard grease for winter and soft grease for summer use is a good lubrication practice.

BERLIN AUTOMOBILE EXHIBITION

An International Automobile Exposition, held in Berlin from October 12 to 22 in the exhibition buildings in the grounds of the Zoological Gardens, was undoubtedly the finest exhibition of motor cars and accessories ever held in Germany.

According to the official catalogue of the exhibition there were 746 distinct exhibits shown by 277 firms, companies, and individual manufacturers. Of the exhibitors 243 were German, 13 French, 1 Italian, 5 American, 1 from Luxemburg, 3 Belgian, 3 Austrian, 3 Swiss, and 5 English. This classification by nationalities does not indicate accurately the countries of origin of the various exhibits, as machinery, automobile parts, and accessories of foreign manufacture were displayed by German firms and companies that are the agents for the sale of such products.

The exposition was confined solely to motor cars for touring and carrying passengers and automobile parts and accessories, cars for industrial and other purposes not being included among the exhibits. On every side there were marked evidences of improvement in construction with numerous refinements. Many of the cars with the same cylinder dimensions were of larger power than formerly, with larger wheel base, with greater speed capacity, and with increased comfort for the passengers and chauffeur. In the upholstery great attention has been paid to securing ease, thus eliminating as much as possible the fatigue incident to the jolting of the cars.

The introduction of the valveless silent motor has stirred up the German manufacturers, so that in many ingenious ways they are endeavoring to obtain an elastic motor and to eliminate as much as possible all noise from the running parts of the machine by the use of other than valves constructed on the Knight system.

In most of the cars exhibited by the manufacturers who have not adopted the valveless type of motor, the valves were incased. In most of the motors exhibited the valves were operated from underneath, but there were many in which they were worked from above. By the latter method it is claimed that a greater motor capacity can be obtained by increasing the diameter of the valve and the number of revolutions, thus securing greater elasticity.

One of the novelties was the inner gearing shown on the Fischer valveless car, whereby by means of a continuous contact it is claimed that a considerable decrease of noise and a higher gearing efficiency are obtained. When using the direct gearing, no cog-wheel transmission is employed, the whole gearing forming a sort of a clutch transmission.

The firm of Romain Talbot exhibited a fine collection of American tires, together with a machine in operation for making a threadwoven-tire. The American skidding chains were also on exhibition.

There has been a great development of the small-car industry in Germany during the past few years. Even the largest concerns have taken up this branch of the automobile trade. With the long piston stroke and increased number of revolutions the small cars attain a high speed.

Much improvement was shown in the trimming of the cars. While some manufacturers have maintained the solid, straight-lined models, others have introduced curved, graceful, and well-proportioned lines. The torpedo form was very much in evidence, with long bodies and low frames. Even the closed cars were constructed on the torpedo lines, with the driver's seat low in the center and the back seats somewhat higher and extending well to the side of the car. In some of the cars the chauffeur was also entirely inclosed and protected from the wind and weather. Frameless windows were seen on many of the high-grade cars.

As a rule, bodies of automobiles are manufactured in Germany by carriage builders and sold separately, thus enabling the customer to make his own selection of the style and make

of the carrosserie. There were exhibited but few cars driven entirely by electricity.

The firm of Schuchardt & Schutte, of Berlin, exhibited a fine line of American tools, all in operation at their full capacity, which attracted much attention.

On the whole the Berlin exposition of 1911 may be considered to have been a great success. The number of paid admissions was 106,000 and probably would have been much larger had the exposition been kept open later than 8 p. m. Many sales were made, especially of medium-priced vehicles. Only three makes of American automobiles were exhibited. The representatives of the American companies stated that they had not only been successful in making sales of their cars for present delivery, but had entered into satisfactory arrangements for establishing agencies throughout Germany.

DEALERS OF EMPIRE STATE MEET

The New York State Retail Implement and Vehicle Dealers' Association met in annual convention at Syracuse, February 20-21, at the St. Cloud Hotel. Nearly all of the 100 members attended.

One of the grievances which the Association has is the fact that a few manufacturers sell implements to farmers' unions, which are in consequence able to undersell local dealers. A number of large manufacturers have refused to do this officially, declaring that an economical disposition of their products lay through legitimate retailers. The question was discussed at some length.

The main feature of the convention was an address by C. M. Johnson, of Rush City, Minn., on the "Proper Finding of Cost," a subject of great interest to the trade. He said that many retail implement and vehicle dealers were unconsciously doing business at a loss. Many thought that if they bought an article for \$1 and sold it for \$1.20 that a profit of 20 cents results, forgetting that the expenses in operating a store must be taken into consideration. For a store doing a \$30,000 business or less annually about 17 per cent. must be figured in for operating expenses, it was pointed out, practically wiping out the profits on goods sold too cheaply. The speaker said the average farmer was the shrewdest buyer in the world.

Burt Giddings, of Baldwinsville, vice-president of the organization last year, was elected president; C. E. Van Wagenen, of Fulton, was chosen vice-president, and J. K. Henderson, of Preble, secretary and treasurer. The new board of directors includes C. E. Wethey, of Port Byron; James F. Williams, of Baldwinsville; F. H. Ebeling, of Syracuse; J. K. Henderson, of Preble; E. L. Marshall, of Ithaca; Josiah Young, of Troy; F. D. Van Wagenen, of Fulton; A. E. Stewart, of Fort Plain, and Frank Howe, of Poland.

TRAVELING MEN'S CLUB MEETING

The annual meeting of the Traveling Men's Club, embracing travelers in the implement, vehicle and related lines in Pennsylvania, New Jersey and Maryland, held its annual meeting at Baltimore, February 22. The secretary reported a membership of eighty-six, a loss of one during the year. He suggested that the dues of the members be increased.

Resolutions of sympathy were adopted and sent to the families of Geo. Fox and E. H. Stuntz, members who died since the meeting of 1911. A resolution was adopted exonerating Secretary J. S. Rawlings, Jr., from the charge of having garbled a report at a former meeting.

The following officers were elected: President, J. S. Connelly; vice-president, B. G. Thomas; secretary-treasurer, J. S. Rawlings, Jr.; executive committee: Walter Miles, chairman; B. S. Weaver, N. D. Vincent, B. W. Gilbert, J. L. Snyder, J. A. Emmig, M. N. Whittaker and J. E. Charles.

The club voted to extend its meeting of 1913 to cover two days, February 21 and 22. The club's annual banquet was held at the Hotel Caswell in the evening.

Carriage and Automobile Painting

BLACK LACQUER FOR METALS

In order to have a quick-drying lacquer—as distinguished from a backed-on enamel or paint—adhere permanently to a metallic surface, as now often required in the manufacture of automobile accessories, the metal surface must be so prepared that there is formed a porous coating inseparable from the metal itself, to which coating the lacquer may adhere. To be sure, certain oil varnishes and turpentine compounded with copal lac, linseed oil and rubber powder will also adhere to smooth metal surfaces, but they demand a long drying period and their tough fibrous structure renders it difficult to grind or buff them; they are not suitable for hurried production. The *Zentralblatt für Optik und Mechanik* offers an empirical method which may be of value.

The porous coating referred to must be built up chemically. After the metal has been polished, grease is removed by benzine or alcohol, and the article must not be touched with the naked fingers after that. The etching mixture to be used to form the desired coating is prepared with 30 parts of ordinary commercial nitric acid, 40 parts of 60 per cent. alcohol, 10 parts of a thick solution of gum arabic and 20 parts of soft water. This is mixed in a glass bottle together with crushed porcelain (to promote uniformity), and the mixture, which must be thick enough to neither run nor drip, is spread sparingly over the metal with a brush. If the first coating does not seem sufficient it should be dried and then another one may be put on top of it. By heating the mixture or the metal, the etching is accelerated. The formed film becomes very firm by exposure to the atmosphere or an air blast after it is dry. After complete hardening the film is smoothed with agate polish and is now ready for lacquering. On brass the film has a greenish, felt-like appearance, while zinc shows a whitish coating.

Any ordinary black lacquer or varnish may now be applied in the usual manner, and many grades of these which are widely obtainable in trade are quite satisfactory. The matter stands differently if an acid-proof coating is wanted and one which may be polished either matt or brilliant. Such an acid-proof black lacquer may be prepared as follows: (1) Copal lac, 30 parts, is stirred, coarsely powdered, into 100 parts of heated turpentine, fine glass splinters being mixed in to promote the solution of the lac and avoid lumps. (2) A solution as thick as possible of Dead Sea asphaltum in turpentine is produced under heat. (3) Powdered ebonite or hard rubber, together with finely powdered bonemeal, is dissolved in a mixture of turpentine and benzol under much higher heat; and the mixture must be stirred vigorously, with broken glass or porcelain, to obviate lumps.

With 10 parts of the first solution, 20 parts of the second and also 20 parts of the third, the desired lacquer is now produced by mixing the three, and it may be thinned with alcohol or benzol to make it easier to handle in the brush. It must not be put on too thick, as then ridges are likely to form in the drying. It is dried at a temperature of 50 to 60 degrees Centigrade.

MANUFACTURE OF PAINT AND VARNISH

A preliminary statement of the general results of the Thirteenth Census of establishments engaged in the manufacture of paint and varnish has been issued. It does not include the pigments ground in establishments classified as "Kaolin and ground earths," or the blacks made by establishments reporting

bone, carbon, and lamp black, as chief products, or the lead and zinc oxides made by lead and zinc smelters.

The general summary shows increases in all the items at the census of 1909, as compared with that for 1904.

The number of establishments increased 24 per cent.; capital invested, 38 per cent.; the gross value of products, 37 per cent.; cost of materials, 32 per cent.; value added by manufacture, 48 per cent.; average number of wage earners employed during the year, 22 per cent.; amount paid for wages, 32 per cent.; number of salaried officials and clerks, 63 per cent.; amount paid in salaries, 83 per cent.; miscellaneous expenses, 40 per cent.; primary horsepower, 36 per cent.

There were 791 establishments engaged in the industry in 1909 and 639 in 1904, an increase of 24 per cent.

The capital invested as reported in 1909 was \$103,995,000, a gain of \$28,509,000, or 38 per cent., over \$75,486,000 in 1904. The average capital per establishment was approximately \$131,000 in 1909 and \$118,000 in 1904.

The value of products was \$124,889,000 in 1909 and \$90,840,000 in 1904. The average per establishment was approximately \$158,000 in 1909 and \$142,000 in 1904.

The cost of materials used was \$79,016,000, as against \$59,827,000.

The total number of pounds of pigments produced in 1909 was 814,566,379, compared with 562,786,177 in 1904.

The total quantity of varnishes made in 1909 was \$34,009,083 gallons and 19,943,526 in 1904, an increase of 71 per cent. The quantity of this total consumed by establishments where manufactured was 4,407,312 gallons in 1909 and 613,684 in 1904.

Liquid fillers reported as a chief product amounted to 1,159,599 gallons in 1909 and 1,051,148 in 1904, an increase of 10 per cent. No comparison is possible for establishments making fillers as by-products.

The total paste and dry fillers and putty reported in 1909 was 239,898,443 pounds, compared with 69,429,550 in 1904, an increase of 245 per cent.

PAINTING METHODS CONSIDERED

At one time orders were often given for painting three or even six months in advance, and the painter might have two months for his work. Now it sometimes happens that a fortnight or less is all the time allowed for a job. It is therefore necessary to know which coats are essential and how far quick color can be used. There is generally time to get one coat of oil color on last thing in the evening and give it all night to dry. The filling up may be mixed with dry white lead instead of tub lead, and four to six coats given in two days, or even five coats in one day, and it may be rubbed down the next day. Then it may have quick color, which will dry in about an hour if necessary, so that a sufficient number of coats may be put on to get a good surface, and yet to get a coat of varnish on at night. When quick color is used the first coat of varnish sinks into the paint and almost disappears; so that some men prefer to give a coat of quick varnish, followed by a coat of hard drying varnish. Others will always, if possible, put a coat of oil color in the top of the quick color before the varnish, says Mr. Holmes, in *Cooper's Vehicle Journal*.

When a small job, such as a new door panel, is in a great hurry, the dry color can be mixed with gold size to the consistency of soft putty, and spread over the panel with a palette knife, and as soon as it is dry rubbed down carefully and varnished, but a job that is hurried is not likely to stand well.

If a paint covers well it is said to have a good body. The

March, 1912]

better the body of the color, the fewer the coats required to make the color solid. Although many colors are supplied to the coach-painter ready ground, he will sometimes have to grind some himself. This is done by mixing the dry color with a little oil or turpentine and grinding it on a flat slab of marble or other hard stone. To grind down a paint can full of color takes a long time by this process, and now there are many small paint mills in use.

Of course the mill must be carefully cleaned after grinding one color before it can be used for another, and this takes time, and therefore when only a small quantity of color is required the slab is the most convenient. Other forms of mills are the grindstone and the roller mill. The latter is made up of three or more rollers rolling in contact, but turning at different speeds.

The art of matching colors can be acquired by practice. Some people, when asked to match a certain green cannot see that there is red in it, and they try vainly to darken the color by blue and black. They cannot see the red, and they are never likely to match color properly. And again, practice is required to find out the staining power and other special qualities of colors. Prussian blue and chrome yellow make a series of green colors according to the proportion of each color. Ultramarine blue and chrome make another series of green, and lampblack and chrome another.

White in some cases can be mixed with pigment and produce a lighter tint of the color; sometimes it spoils the color, making it milky. Black will darken some colors, but entirely alters others.

Black japan or asphaltum if used for an undercoat will, after a time, show through the finishing coats; and many of the pigments sold as paints are more or less liable to fade. The lakes are the worst colors in this respect, and in some cases a color made by one firm is exactly the same in appearance as that made by some other, but the one is permanent and the other fades, and may after three or six months time entirely spoil the appearance of the job. The coach painter ought to take the trouble of testing his colors, and the best way is to paint a stripe of each color on two boards and varnish them; expose one board to the sun and rain, and keep the other in the dark. Compare the two boards every month, and by six months he will know which colors are permanent. And in the same way he can test the japan and the varnish of different makers, and he will see which keeps its gloss longer, and which is most liable to crack, and he can also test the effects of different kinds of dryer, and will get a practical knowledge of the risk he runs who uses too much dryer.

When varnishing, especially for the finishing coat, every care must be taken to keep the job free from dust. If it is a carriage or motor body, it should be carefully washed off (after having been flatted) and carefully wiped over with a damp chamois leather and allowed to dry. The varnish should have been put in the varnish tin covered from the dust, and kept for half a day at least in the varnishing room with the body so that both may be of the same temperature. The last coat is usually put on as thick, that is, as full a coat as is possible without risk of the varnish running down; and it is laid off as evenly as possible, a slight extra drag on the brush warns the painter that he has laid it off sufficiently, and he usually finishes with the brush marks, which should be only faint ones, running horizontally, and in a short time the varnish will have "flowed out," and the brush marks will have disappeared.

If too much varnish has been put on it will run down the panels and fill up the moldings, and if there is too little, all the brush marks will show. In either case the job is spoiled, and if it is a first class job, must be varnished again, and it will not be hard enough to flat down for three or four days, so that both time and money have been wasted.

A painter soon discovers that most of his time is occupied in preparing the job for the various coats. Thus there is sand papering after every coat of paint, rubbing down after filling

up, and flatting after all but the last coat of varnish, and then the coats of best color are often flatted instead of sand papered. Flatting requires the use of plenty of water; therefore time must be allowed for the damp to dry off before another coat can be put on, so that when it is necessary to save time or to save money, one of the first things attempted is to shorten the time spent in flatting and sand papering. The object of both flatting and sand papering is to remove the brush marks and to give the next coat a proper hold. If varnish is not flatted the second coat will often "crawl," that is, collect in patches like oil on water.

The sand papering after paint may be omitted without much harm, especially after quick color or any coats that have dried "dead" without gloss; and sometimes half the flatting down is omitted. Thus when the first coat of undercoat body varnish is tacky it is lightly rubbed with the damp palm of the hand just enough to take the gloss off the varnish; and the moldings and corners of panels where the hand could not touch them are very lightly flatted and a second coat of varnish is put on "on the tack." This is afterwards properly flatted out and a third coat of varnish put on. This is finishing varnish, and when tacky is rubbed with the palm of the hand and treated as the first coat of varnish was, and it received its fourth and final coat whilst the third coat is still tacky. This requires great care and considerable skill, and no one ought to attempt it on a carriage until he has been successful in varnishing a good number of old panels in the same way.

Sometimes the painter finds a coat of paint has not dried properly. That may be the fault of the paint. Lamp black takes a long time to dry, and should be mixed with boiled oil, and as lamp black is often used in lead color, it may cause the lead color to dry badly. Or the job may have stood in the smith's shop and smoke has deposited a thin layer of oil or soot on it, which will prevent the paint drying, or the job may have been damp, either because the water from rubbing or flatting had not thoroughly dried or because the atmosphere was very damp.

If paint or varnish does not dry in about the proper time, it is better to wash it off with turps, as if left on, and after another 24 hours found to be dry, it is very likely to spoil the coats that follow, causing them to crack or blister, because it is only dry on the outside—has skinned over, as it were.

Edges of springs and all the chassis of a motor car is likely to be very greasy, and after cleaning off with turps, should have a coat of knotting or gold size before being painted.

The last coat of varnish sometimes goes wrong on account of damp: either the job was not really dry when varnished, or damp has been deposited upon it whilst it was setting; this generally shows as a kind of pock mark, and the painter cannot account for it, because the damp was deposited in the night, but dried up before the painter arrived in the morning; sometimes the evil is aggravated by a very wet paint shop floor. The air will absorb a certain amount of moisture, and the higher the temperature the more moisture it will take up, and it is said to be saturated when it has taken up all it can at any particular temperature.

If a job was varnished with the surrounding air at 70 degrees and containing as much moisture as the air would hold at 65 degrees, the job would dry all right if the temperature did not sink below 65 degrees until after the varnish was set; but if it sunk below 65 degrees before the varnish was set, the varnish would be pitted more or less, according to the amount of dew deposited. Another common defect is that pin heads, screw heads, etc., show through the paint, usually because the stopper has shrunk less or more than the filling up.

The tools required by a coach painter are: One or two buckets, a sponge, two chamois leathers, a box for fine and coarse pumice dust, and one for rotten stone, some pumice stone, and a piece of flat sand stone to sharpen the pumice stone on, some artificial pumice stone, and paint brushes, and sash tools, and fitches, and a duster, some picking out and fine

lining pencils, camel hair mops and brushes, and perhaps, a badger softener.

Brushes are generally used first in common color and japan, and when the painter considers they are in fit condition, they are carefully washed out in turpentine and then used for best color and varnish; when not in actual use, paint brushes that have been used are kept suspended in water, as if paint or varnish dried upon a brush it would be spoiled, and the point of the brush must not touch the bottom of the vessel. Varnish brushes are suspended in the same kind of varnish that they are used for, and japan brushes in japan; a special deep can, called a keeper, is used for this purpose, and the varnish or japan in the keepers has generally some linseed oil added to it, and the varnish keeper is carefully covered to keep out dust. The pencils for picking out and fine lining are well washed in turps, greased and stuck on a board, to keep the hairs straight; camel hair mops are usually kept in the color they are used for or in some dirty turps.

The brushes and tools are made of pig's bristles, and when new the bristles of some of them are longer than necessary, so the painter ties them or binds them with string from the handle end until there is just a sufficient length of bristle left free, and as the points of the bristles wear off and get too short, he unwinds the string by degrees so as to keep the bristles the most convenient length. There are a number of flat brushes made which some painters prefer; these do not require binding, as the bristles are only the right length to begin with, and they can be used for varnish brushes without the preliminary working down in color.

The picking out and fine lining pencils are made from red or brown sable and from Siberian ox hair—the sables are the best and the most expensive. For any of these pencils the hair must be very long, and when greased and put by, must have the hairs quite straight.

Some men prefer Siberian ox hair pencils for heavy colors like vermilion, as they are stiffer than sable.

Paint pots of glazed earthenware are used in some paint shops, but tin paint cans are now more generally used.

Sponges are of two sorts, turkey and honeycombe. Turkey sponges are finer and wear longer than honeycomb; they are usually cup shape or flat.

Honeycomb sponges have much larger holes in them than turkey, and can be had in larger pieces. They do not wear as well as turkey, but are much cheaper. The painter in choosing a sponge should avoid a very pale colored one or one that tears easily.

BLACK PANELS

Following are six ways of painting black panels that may be interesting to some who are in the novice stage still. The writer gave his views in the Australian Coach Builder, to whom we are indebted.

No. 1—After rubbing down, the panels are sandpapered with 1½ sandpaper, and the fatty edge of filling which accumulates in the process of filling up is scraped off; a coat of lead color is put on; when dry it is stopped up with hard stopping made of dry white lead, vegetable black, gold size, varnish and turps, and allowed to stand until next day; then the stopping and lead color is faced down to a smooth surface with 1½ sandpaper, and given another coat of lead color mixed with raw oil, patent driers, and turps, when it is allowed to stand until next day. It is again sandpapered, and a coat of oil drop black is applied. Next day it is rubbed over with curled hair and a coat of quick drop black put on which is followed when dry by a coat of black japan, and left a day, when it is flatted and another coat of black japan put on. The next day it is again flatted, and is given a coat of flattening varnish; on the day following it is again flatted and varnished with a coat of hard-drying varnish, and allowed to stand at least a couple of days,

when it is flatted down, and the following day a coat of finishing varnish is applied.

No. 2—After the panel is rubbed down it is sandpapered, and a coat of lead color is applied. When dry it is stopped with hard stopping, which, when thoroughly dry, is faced down with lump pumice stone, sandpapered with fine, or old worn sandpaper and puttied up; then a coat of quick drop black is applied. After standing for an hour, it is coated with black japan. Next day it is flatted down and a coat of hard-drying varnish applied. After which it is allowed to stand, according as the job may be wanted, then flatted down again and finished with one coat of finishing varnish.

No. 3—The commoner class of work is generally done in the following manner: When rubbed down and sandpapered, a coat of lead color is applied. When dry, it is stopped up with sandpaper stopping, and afterwards sandpapered down level; then a coat of quick drop black is applied, then a coat of varnish drop black or black japan. Next day it is flatted down and finished with one coat of finishing varnish.

No. 4—As he is rubbing down the job, the painter, with a small fitch, dabs some light lead color into the holes or imperfections he sees as he goes along, instead of casting the panels all over. When the dabs or the patches of color are dry, they are filled up with hard stopping. The stopping is faced down, and the panels are sandpapered all over with fine sandpaper. Then either two coats of quick black and a coat of clear varnish, or one coat of quick black and one coat of varnish color black, are applied. Then one or two coats of varnish, according to price and time, follows.

No. 5—After it has been rubbed down, sandpapered, and the edges cleaned up, it is given a coat of lead color, and stopped with hard stopping, which, when dry, is faced down with lump pumice stone, sandpapered with fine sandpaper, and again coated with lead color. It is again stopped, faced down with fine sandpaper, then coated with oil vegetable black. When dry, it is rubbed over with curled hair, and given a coat of quick drop black and a coat of varnish color black; then another coat of varnish color black, containing less black than the previous one, is applied, followed by another coat containing still less black, and finished with one coat of clear finishing varnish, each coat being properly dry and flatted before the succeeding one is applied. The object in using varnish color right up to the finishing coat is to get a panel which will not look green when finished.

No. 6 is done in the same manner as the previous one up to the second coat of lead color, and, when sandpapered, given a coat of quick black, then a coat of black japan, and allowed to stand two days; then it is faced down with lump pumice stone, flatted with pumice powder, and another coat of black japan is put on, and left to stand two days. It is faced down as before, and given a coat of hard-drying varnish; then flatted with pumice powder, and finished with one coat of finishing varnish.

MUST BECOME AMERICANIZED

President F. A. Seiberling, of The Goodyear Tire & Rubber Co., says that foreign labor at the Goodyear plant will be compelled to acquire a certain knowledge of the English language, and of rules of government leading to citizenship papers. Laborers refusing to submit to these tests will be discharged. This education is offered free in the evening schools of Akron.

Mr. Seiberling also says: "I consider it Akron's duty to give the foreign population high ideals of citizenship. It is Akron's fault that the police court is filled with men who are a menace to the city. We have kept aloof from the immigrants. We have centered in our own prosperity, but Akron is second to no city in the United States commercially. In 1865, 600 men were employed here; today we have a labor roll of 25,000, and we are far enough advanced materially to devote time to the common good."

DIESEL MOTORS FOR AUTOMOBILES

In appearance this motor is simple, and it is a simple engine, even though it has four valves per cylinder. Regarding the single-cylinder 5 h.p. motor, one finds a four-cycle engine not unlike the gasoline motor in its general arrangement. There is the water-cooled cylinder with separate water-cooled head, which contains distinct valves for inlet, exhaust, fuel injection, and starting. A single camshaft operates the tappets, of which there are four; there is a governor on the main shaft, and the piston, connecting rod, and crank-throw. It is only to be remarked that the cylinder of the two-stage air compressor is cast in one piece with the power cylinder, and one may also note that the crank-throw for the compressor is machined right next to the web of the main crank-pin.

In a series of tests made by Prof. Romberg, this engine was run with different loads, and many measurements were made. The indicator diagrams show that, in applying the Diesel principle to high-speed engines, the curve tends to lose its Diesel characteristics and inclines towards explosion indications. It is not correct to state that the combustion takes place at constant pressure, as in the big, slow-speed Diesels, and equally there is no explosion. The indicator diagrams show, in fact, that combustion is prolonged at a slightly increasing pressure, this being noticeable as well when the engine is running light as when it has an overload.

In this small high-speed type, the injection valve is kept open for about one-twentieth of the stroke under normal full load, and combustion is continued during the whole of this period. It is the injection of fuel which is the most difficult problem in the development of the Diesel automobile motor. The quantity of oil is measured by a small ram pump, and the injection into the combustion space is effected by high pressure air. To time the opening of the injection valve correctly is vital to the motor: to time its closing correctly is important to economy, and in dealing with high pressures of air and high engine speeds, the problems arising from the inertia of both oil and air must present difficulties. The fuel pump and injection valve are operated from half-time shafts, and, as their motion is reciprocating, they are placed under a heavy duty. These difficulties will not stand in the way of development, but they account largely for development not having been quicker.

In the tests, the fuel was Galician residual oil of .865 specific gravity and with a heat value of 9,850 calories. The following consumptions were noted:

	Pt. per b.h.p. hour
Normal full load.....	0.498
Overload	0.555
Three-quarter load	0.533
Half-load	0.640
Quarter-load	0.993

Since the traducers of Diesel engines are fond of making the general assertion that what is saved in fuel is lost in lubricating oil, it is worth while quoting that the 5 h.p. Diesel on test showed during the eight hours full-load trial a consumption of 0.52 oz. of lubricating oil per b.h.p. per hour, which Prof. Romberg, who was responsible for the tests, suggested could be brought down to 0.2 ozs. per b.h.p. hour, while providing proper lubrication.

These figures are for a small single-cylinder 5 h.p. motor, which at full load had a mechanical efficiency of 58 per cent. In a four-cylinder engine, with still but one compressor, the mechanical efficiency would be higher and the fuel consumption lower. It would appear that the higher speed of the Diesel automobile motor will cause the consumption to increase slightly, and if, therefore, the assumption be made—it can be disputed—that the decrease due to the greater efficiency of the four-cylinder Diesel motor will balance the increase that will probably arise from the higher engine speed, one may adopt the consumption figures as a basis for argument.

How far prices might be compared for the purchase of gas

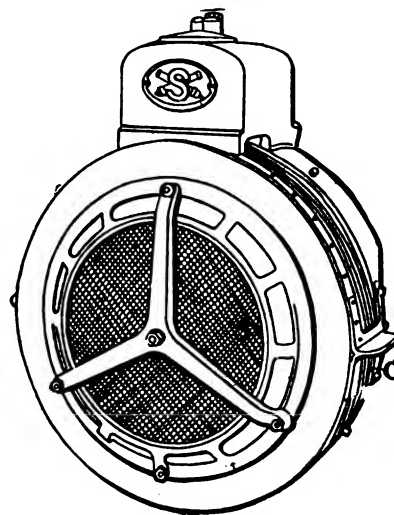
oil in small quantities it is impossible to say. It is an oil which goes to the gasworks, but otherwise it is not much used, and there is no organized distribution system for it. Thus the anomaly can be found that one may pay more for a gallon of gas oil than for a gallon of paraffin, although the former is the cheaper oil. Cost of distribution governs the whole question.

It will be asked how the necessary control of speed is obtained over the Diesel motor to fit it for motorcar work. The arrangement is that one part of the engine can be de-clutched to work the compressor, whilst the other part of the engine will run solely with compressed air. That will give a range of control for the lower speeds, and, for the higher speeds the whole engine will drive as a single unit. Apart from the motor and from the control arrangements, the chassis will be of orthodox style. In respect of the control arrangements, it is possible that there will be a novel feature. The speed changes, brake applications, and clutch movements will perhaps be effected by air pressure, the driver having merely to press buttons. On an ordinary motor vehicle such a system would seem out of place. On a Diesel vehicle it seems quite the right thing, because air pressure is always available. And in this connection it may be remarked that compressed air control is used on many of the Diesel marine reversible engines, in one instance even the valves that admit the starting air being themselves opened or closed by air pressure. With an ample supply of compressed air always available, can anything appear simpler than to have the gear-strikers, for instance, acting as pistons in barrels to which air pressure can be admitted by the pushing of a button? This system of control is not essential, but it is strongly favored.

At the present time the position is that many of the difficulties which had to be overcome before the high-speed Diesel engine could be produced have been solved.

FORCED-DRAFT RADIATOR

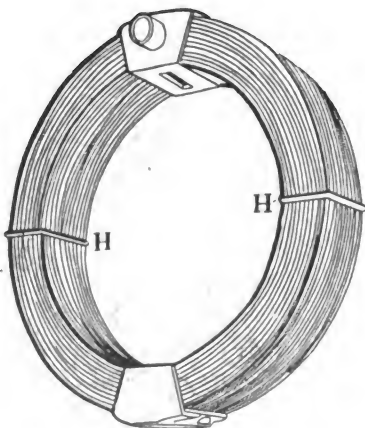
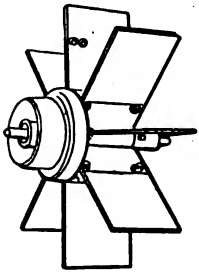
The principle of the centrifugal blower which has been applied for several years in the United States in connection with air-cooled motors, such as the Frayer-Miller and the Franklin, has been adopted in connection with water cooling and a special radiator constructed for all the vehicles controlled by the General Omnibus Company, of Paris, after extensive competitive trials. The radiator in question, called the Solex, is the same that has been used for some time on Schneider and



De Dion buses and the appearance of which is familiar to Parisians and visitors to Paris. One of the principal objects aimed for in the construction of this radiator is robustness, considering that the honeycomb radiator has been found too frail for withstanding the vibrations to which a radiator is exposed on commercial trucks and buses running on solid tires. The efficiency of the centrifugal blower, which is rated as five

to six times higher than that of the ordinary automobile fan, gives the opportunity for combining the desired strength of construction, as well as low cost of production, with a correct and efficient system for regulating the temperature of the cooling water independently of the vehicle speed and somewhat in accordance with the variable heat generation of the motor. The fundamental idea of the designers seems to have been the simple and obvious one that if the positive-acting centrifugal blower is capable of improving the regulation of air-cooled engines, though it is difficult to lead the air currents so that they will absorb heat equally from all those parts of the cylinder surfaces which are in equal need of cooling, it should be doubly advantageous in connection with a radiator, if the latter is specially built with a view of giving the air currents unhindered passage over the surfaces to be cooled, at all motor and fan speeds. In the ordinary radiator, with a thrust or suction fan placed behind it, the resistance to the passage of the air over the water conduits is increased very much at high fan speeds through the formation of eddies due partly to the tubular shape of the air channels and partly to the irregular relations between the air currents and the air passages. The accompanying illustrations show the simple mechanical arrangements in the new radiator design by which these shortcomings in ordinary cooling methods have been avoided.

The ventilating fan, Fig. 2, is placed in the interior of a nest of copper tubes, Fig. 3, two bundles, H and H1, of these tubes being bent in half circles and gathered into a collector B for the hot water at the top and another collector C for the cooled water at the bottom. The centrifugal fan F draws the air in through the opening around its axis and throws it out around the whole periphery, and in between the smooth copper tubes which are suitably spaced apart to allow the air to pass. The central air intake is protected by a screen S, Fig. 1, to reduce the quantity of gross impurities which a centrifugal fan is liable to draw from the atmosphere, and it is noticed that the arrangement of the tubes, in conjunction with their smooth surfaces, renders it easy to clean the cooling surfaces of whatever foreign substances may find lodgment there. The curved conformation of the tubes allows them to yield under the influence of vibrations or flexions of the chassis without straining the joints with the bronze collectors. The



whole nest of tubes is protected against injury from the outside by means of a sheet metal casing, being secured to this casing by two bolts which pass through tubular channels in the collectors, still leaving the nest of tubes free to accept deformations, and the casing is mounted upon the chassis by suitable steel brackets. At the center of the casing a shaft is supported in front by means of an aluminum spider and at the rear in a

steel bracket, and upon this shaft the fan revolves mounted upon two ball bearings more than 10 inches apart.

On top of the upper collector B there is mounted an aluminum tank T holding about 2 gallons of water, for a motor of about 30 horsepower, but the hot water from the cylinders is discharged into the collector. The author of the article mentions that this forced draft radiator was in use upon the Lefebvre tractor at the recent trials of self-propelled agricultural machines at Roubaix and Laon and proved to be the only one providing sufficient cooling for the hard-worked engines on those occasions.—*La Vie Automobile*.

SOMETHING WORTH REMEMBERING

Mr. E. J. Edwards, in his copyrighted article on the "news of yesterday," speaks of James Brewster, telling a story not generally known or remembered.

The promoter of the merger between the New Haven and Hartford and the New York and New Haven Railroad companies, a transaction which led to the development of the present great New Haven railroad system, was the late William D. Bishop, at one time president of the New Haven system. It was Mr. Bishop's father who organized the New York and New Haven Railroad in 1848.

"Ever since I have been in railroading," Mr. Bishop once said to me, "I have heard about the pluck displayed by men who organized the first railroad companies in the United States. But of all the stories I know of that pioneer era I think the one I like best is that about James Brewster.

"James Brewster made a fortune from the manufacture of carriages in New Haven, when he turned his attention to railroads. That was in 1833. As there were steamboats running between New York and New Haven, he thought it would be a good plan to build a railroad from New Haven to Hartford to connect these steamboats. But when he went about seeking capital with which to build the road he found the people cold.

"Was James Brewster discouraged? Not a bit! 'Well,' he said to himself, 'if no one will help me I'll build it myself.' So he gave to the company practically all of the land it needed for its New Haven entrance, and then he began giving it all of his time.

"At last he got around to the problem of securing rails for the road. He decided he wanted the kind English roads were using—almost all of the early rails in this country consisted of strap iron fastened on to wooden ties. Brewster found there wasn't a manufacturer in this country who could make them. He also discovered that if he were to get from England rails in sufficient quantity to lay the thirty-five miles of track between New Haven and Hartford he would have to pay \$250,000 for them—a very handsome sum in those days.

"Brewster wrote to British manufacturers, offering the securities of the railroad company in payment for the rails he needed. The manufacturers wouldn't look at the securities, but they wrote that if Mr. Brewster personally would guarantee payment, or would give his own notes in payment for the rails, he should have them; but on no other terms.

"Brewster didn't hesitate a moment. He bought the rails, under the terms imposed, although in so doing he pledged practically all of his personal property and would have been a bankrupt if the venture failed. Fortunately, it proved to be successful, but there were five years at least when James Brewster's entire fortune and his credit and reputation as a business man were entirely tied up in that little railroad running from New Haven to Hartford."

UNITED STATES TIRE CO. QUILTS RETAILING

The United States Tire Co. has declared itself out of the retail business, thereby voluntarily relinquishing a very profitable trade. Formal notice of the fact is contained in an announcement mailed to dealers throughout the country.

Carriage and Automobile Accessory Trades

BUYERS' GUIDE

The Hub Carriage and Automobile
Accessory Directory. Issued Quarterly.

VOL. 1 MARCH, 1912 NO. 2

*A classified list of articles used by the Trade, arranged alphabetically,
with names of makers in alphabetical order under
the respective headings.*

A COMPLIMENTARY SERVICE TO THE TRADE

ALUMALOYD SHEETS.

Alumaloyd Products Co., Canton, O.

ANTI-RATTLERS AND QUICK-SHIFTERS

(See Couplings)

ANVILS

Columbus (O.) Anvil & Forging Co.
Columbus (O.) Forge & Iron Co.
Eagle Anvil Wks., Trenton, N.J.
Hay-Budden Mfg. Co., Brooklyn, N. Y.
Potts & Co., H. T., Philadelphia
Wiebusch & Hilger, New York
Wright & Sons, P., New York
Swedish Iron & Steel Co., N. Y. City.

AUTOMOBILES

Abbott Motor Co., Detroit, Mich.
Alpena Motor Car Co., Alpena, Mich.
American Motors Co., Indianapolis, Ind.
Argo Electric Vehicle Co., Saginaw, Mich.
Auburn Automobile Co., Auburn, Ind.
Austin Automobile Co., Grand Rapids, Mich.
Babcock, H. H. Co., Watertown, N. Y.
Bailey, S. R. & Co., (electric) Amesbury, Mass.
Baker Motor Vehicle Co., Cleveland, O.
Bartholomew Co., Peoria, Ill.
Bergdoll Motor Co., Philadelphia, Pa.
Briggs-Letroit Co., Detroit.
Hrusn Runabout Co., Detroit.
Buckeye Mfg. Co., Anderson, Ind.
Buick Motor Car Co., Flint, Mich.
Cadillac Motor Car Co., Detroit.
Cartercar Company, Pontiac, Mich.
Century Electric Car Co., Detroit, Mich.
Chalmers Motor Co., Detroit.
Clarke-Carter Automobile Co., Jackson, Mich.
Cole Motor Car Co., Indianapolis, Ind.
Columbia Motor Car Co., Hartford, Conn.
Columbus (O.) Buggy Company
Corbin Motor Vehicle Corp., New Britain, Conn.
Corbitt Automobile Co., Henderson, N. C.
Crow Motor Car Co., Elkhart, Ind.
DeTambles Sales Co., Anderson, Ind.
Duryea, Charles E. Co., Saginaw, Mich.
Elkhart Carriage Co., Elkhart, Ind.
Elmore Mfg. Co., Clyde, O.
Enger Motor Car Co., Cincinnati, O.
Ford Motor Car Co., Detroit.
G. J. G. Motor Car Co., White Plains, N. Y.
General Motors Co., Detroit.
Great Western Auto Co., Peru, Ind.
Haberer & Co., Cincinnati, O.
Havers Motor Car Co., Port Huron, Mich.
Haynes Automobile Co., Kokomo, Ind.
Hermesnoy Motor Co., Detroit.
Hudson Motor Car Co., Detroit.
Hupp Motor Car Co., Detroit.
Ideal Motor Car Co., Indianapolis, Ind.
Imperial Automobile Co., Jackson, Mich.
Inter-State Automobile Co., Muncie, Ind.
Thos. B. Jeffrey & Co., Kenosha, Wis.
King Motor Car Co., Detroit.
Kissel Motor Car Co., Hartford, Wis.
Krit Motor Car Co., Detroit.
Lion Motor Car Co., Adrian, Mich.
Lozier Motor Car Co., Detroit.
McFarlan Motor Car Co., Connersville, Ind.
McIntyre Co., W. H., Auburn, Ind.
Martin Carriage Works, York, Pa.
Mercer Automobile Co., Trenton, N. J.

Metzger Motor Car Co., Detroit.
Michigan Buggy Co., Kalamazoo, Mich.
Middletown Buggy Co., Middletown, O.
Moline Auto Co., Moline, Ill.
Moon Motor Car Co., St. Louis, Mo.
Moyer, H. A., Syracuse, N. Y.
National Motor Vehicle Co., Indianapolis.
Nordyke & Marmon, Indianapolis, Ind.
Ohio Motor Car Co., Cincinnati.
Packard Motor Car Co., Detroit.
Palge Detroit Motor Car Co., Detroit.
Palmer & Singer Mfg. Co., Long Island City, N. Y.
Paterson Co., W. A., Flint, Mich.
Penn Motor Car Co., Pittsburgh.
Pilot Motor Car Co., Richmond, Ind.
Premier Motor Mfg. Co., Indianapolis.
Pullman Motor Car Co., York, Pa.
Rauch & Lang Carriage Co., Cleveland, O.
Regal Motor Car Co., Detroit.
Reo Motor Car Co., Lansing, Mich.
Schacht Motor Car Co., Cincinnati, Ohio.
Selden Motor Vehicle Co., Rochester, N. Y.
Standard Electric Car Co., Jackson, Mich.
Staver Carriage Co., Chicago, Ill.
Stevens-Duryea Co., Chicopee Falls, Mass.
Streator Motor Car Co., Streator, Ill.
Studebaker Corporation, South Bend, Ind.
E. R. Thomas Motor Co., Buffalo, N. Y.
U. S. Motors Co., N. Y. City.
Warren Motor Car Co., Detroit, Mich.
White Co., The, Cleveland, O.
Winton Motor Carriage Co., Cleveland.

AUTO BODIES AND BODY PARTS

See Bodies and Seats for Carriages, Wagons and Automobiles.

AUTO DASHES, FENDERS, RAILS, ETC.

See Dashes, Fenders, Rails, etc. for Carriages, Wagons and Automobiles.

AUTO FABRICS

F. S. Carr Co., Boston, Mass.
L. C. Chase & Co., Boston, Mass.
Fine Woolen Co., N. Y. City.
Laidlaw, Wm. R., Jr., New York
Muttly Co., L. J., Boston, Mass.
Parry & Co., A. N., Amesbury, Mass.

AUTO FORGINGS

See Carriage, Wagon and Automobile Forgings

AUTO HARDWARE

See Carriage, Wagon and Automobile Hardware.

AUTO LEATHER, PATENT AND ENAMELED.

See Leather, Patent and Enamelled, for Carriages, Wagons and Automobiles.

AUTO MOUNTINGS AND LAMPS.

See Mountings, and Lamps for Carriages, Wagons and Automobiles.

AUTO OIL CLOTH.

See Oil Cloth for Carriages, Wagons and Automobiles.

AUTOMOBILE PARTS

American Distributing Co., Jackson, Mich.
Baker, W. C., Amesbury, Mass.
Bretz Co., J. S., New York City
Bridgeport (Conn.) Brass Co.
Brunner Mfg. Co., Utica, N. Y.
Carey & Co., Philadelphia, Pa.

Cleveland (O.) Hardware Co.
Bowen Mfg. Co., Auburn, N. Y.
F. H. Bultman Co., Cleveland, O.
Flint (Mich.) Axle Works
Frost Gear & Machine Co., Jackson, Mich.
Gaylord Co., The F. L., Ansonia, Conn.
Gilbert Mfg. Co., New Haven, Conn.
Hoadley, F. B., Waterbury, Conn.
Hoyt Electrical Instrument Works, Penacook, N. H.
Lewis Spring & Axle Co., Jackson, Mich.
Mayer Carbueter Co., Buffalo, N. Y.
Merchants & Evans Co., Philadelphia, Pa.
Merrimac (Mass.) Specialty Mfg. Co.
Morse, Frank W., Boston, Mass.
Muncie Gear Works, Muncie, Ind.
National Brass Mfg. Co., Rochester, N. Y.
Ochsner & Sons Co., A., New Haven, Conn.
Philadelphia (Pa.) Timer & Mach. Co.
Phosphor Bronze Smelting Co., The, Philadelphia, Pa.
Planhard Carburetor Co., Kokomo, Ind.
Powell Muffler & Timer Co., Utica, N. Y.
Sparks-Withington Co., Jackson, Mich.
Union (N.Y.) Forging Co.
Willett Engine & Carburetor Co., Buffalo, N. Y.

AUTO RUBBER TIRES

(See Rubber Tires)

AUTO SPRINGS, GEARS, ETC.

See Springs, and Gears for Carriages, Wagons and Automobiles.

AUTO TOPS

See Tops and Top Parts for Carriages, Wagons and Automobiles.

AUTO TRIMMING MATERIALS

See Trimming Materials for Carriages, Wagons and Automobiles.

AUTOMOBILE NOVELTIES

Specialties, Toilet Cases, Limousine Trimmings, etc.

Gus Balzer Co., N. Y. City.
C. Cowles & Co., New Haven, Conn.
English & Mersick Co., New Haven, Conn.
A. N. Parry & Co., Amesbury, Mass.
Bridgeport Coach Lace Co., Bridgeport, Conn.
Metal Stamping Co., L. I. City, N. Y.

AUTO WHEELS

See Wheels for Carriages, Wagons and Automobiles.

AXLES, ETC.

(Including Cone, Ball and Roller Bearing.)
For Carriages, Wagons and Automobiles.

Aden Mfg. Co., Danville, Va.
American Ball Bearing Co., Cleveland, O.
Ansted Spring & Axle Co., Connersville, Ind.
Automatic Axle Co., Lancaster, Pa. (Cone and Ball Bearings)
Bower Roller Bearing Co., Detroit, Mich.
Cincinnati & Hammond Spring Co., Cincinnati, O.
Cleveland Axle Mfg. Co., Canton, O.
Concord Axle Co., Penacook, N. H.
Flint (Mich.) Axle Works
Frost Gear & Machine Co., Jackson, Mich.
Gardner Axle and Machine Co., E. J., Carlisle, Pa.
Hess-Pontiac Spring & Axle Co., Pontiac, Mich.

Hess Spring & Axle Co., Carthage, O.
Higgins Spring & Axle Co., Racine, Wis.
Houston-Hay Axle Co., Coshoc-ton, O.
Illinois Iron & Bolt Co., Carpenterville, Ill.
Kalamazoo Spring & Axle Co., Kalamazoo, Mich.
Lewis Spring & Axle Co., Jackson, Mich.
Liggett Spring & Axle Co., Pittsburg, Pa.
Makutchan Roller Bearing Co., Chicago, Ill.
Mott Wheel Works, The, Utica, N. Y.
Muncie Gear Works, Muncie, Pa.
Salsbury Wheel & Mfg. Co., Jamestown, N. Y.
Scranton (Pa.) Axle and Spring Co.
Sheldon Axle Co., Wilkes-Barre, Pa.
Spears Axle Co., Wheeling, W. Va.
Timken-Detroit Axle Co., Detroit, Mich.
Timken Roller Bearing Co., Canton, O.
Weston-Mott Co., Flint, Mich.
Western Spring & Axle Co., Cincinnati, O.
Wurster & Co., F. W., Brooklyn, N. Y.

BALL BEARINGS

American Ball Bearing Co., Cleveland, O.
Auburn Ball Bearing Co., Rochester, N. Y.
Bretz & Co., J. S., New York City.
Hess-Bright Mfg. Co., Philadelphia, Pa.
S. K. F. Ball Bearing Co., N. Y. City.
Standard Roller Bearing Co., Philadelphia, Pa.

BATTERIES For Electric Vehicles

Edison Storage Battery Co., Orange, N. J.
Electric Storage Battery Co., Philadelphia, Pa.

BENDING Pipe

National Pipe Bending Co., The, New Haven, Conn.
Pipe Bending Co., Philadelphia, Pa.

BENT WORK

See Woodstock.

BEVEL MITRE CALCULATOR

Powell, J. B., Philadelphia, Pa.

BLOWERS AND FORGES

Buffalo (N.Y.) Forge Co.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Champion Blower & Forge Co., Lancaster, Pa.
Electric Blower Co., Boston.
Roots, P. H. & F. M. Co., Connersville, Ind.
Silver Mfg. Co., Salem, O.

BODIES, SEATS, ETC. Wood and Metal.

For Carriages, Wagons and Automobiles.

Ahr & Rost Co., Cincinnati, O.
American Body Co., The, Buffalo, N. Y.
American Veneer Co., Kenilworth, N. J.
Amesbury (Mass.) Metal Body Co.
Auto Body Co., Lansing, Mich.
Auto Parts Co., Chicago, Ill.
Baily & Co., S. E., Lancaster, Pa.
Barnes-Curtiss Co., N. Y. City.
Biddle & Smart Co., The, Amesbury, Mass.
Biehl's Carriage and Wagon Works, Reading, Pa.
Blue Ribbon Auto and Carriage Co., Bridgeport, Conn.
Brown Auto-Carriage Co., The, Cleveland, O.
Buckeye Carriage Body Co., Bellefontaine, O.
Burling, W. G., Philadelphia, Pa.

Carriage Woodstock Co., Owensboro, Ky.
 Central Mfg. Co., Connersville, Ind.
 Cincinnati Panel Co., Cincinnati, O.
 City Carriage Factory, Red Bank, N. J.
 Collings Carriage Co., Camden, N. J.
 Collins Vehicle Woodwork Co., R. N., St. Louis, Mo.
 Crescent Body Works, Reading, Pa.
 Dann Bros. & Co., New Haven, Conn.
 Dunham & Son, D. B., Newark, N. J.
 Excelsior Seat Co., The, Columbus, O.
 Fleetwood (Pa.) Metal Body Co.
 Fisher Body Co., Detroit, Mich.
 Fitz Gibbon & Crisp Co., Trenton, N. J.
 Gresham Mfg. Co., Griffin, Ga.
 Hale & Kilburn Co., Phila., Pa.
 Harris-Glenn Body Co., Oxford, N. C.
 Herzog Art Furniture Co., Saginaw, Mich.
 Hollander & Morrill, Amesbury, Mass.
 Holt Bros. Mfg. Co., Concord, N. H.
 Howarth & Rogers Co., Amesbury, Mass.
 Irwin Mfg. Co., R. J., Indianapolis, Ind.
 Jewett-Gamage Co., Worcester, Mass.
 J. B. Judkins Co., Merrimac, Mass.
 Keystone Sheet Metal Co., Ambridge, Pa.
 Keystone Vehicle Co., Reading, Pa.
 Kimball & Co., C. P., Chicago.
 Klinger, Louis, New York City.
 Lawson Co., The F. H., Cincinnati, O.
 Lowell (Mich.) Cutter Co.
 Media (Pa.) Carriage Mfg. Co., Cleveland, O.
 Mifflinsburg (Pa.) Body & Gear Co., The
 Millcreek Wagon Co., Cincinnati, O.
 E. M. Miller Co., Quincy, Ill.
 Miller Bros., Inc., Amesbury, Mass.
 Miller & Co., A. J. Bellefontaine, O.
 Mount Co., J. W., Red Bank, N. J.
 New Haven Carriage Co., New Haven, Conn.
 Ohio Seat Co., Cincinnati, O.
 Parry Mfg. Co., Indianapolis, Ind.
 Powitsky & Collins Carriage Woodwork Co., St. Louis, Mo.
 Quinby & Co., J. M. Newark, N. J.
 Racine Mfg. Co., Racine, Wis.
 Rickards & McLaughlin Wagon Co., Philadelphia, Pa.
 Rothschild & Company, New York City.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Aug. Schubert Wagon Co., Oneida, N. Y.
 Sidney (Ohio) Mfg. Co., The
 J. P. Sjoberg Co., N. Y. City.
 Thompson Co., E. J., Pittsburg, Pa.
 U. S. Woodworking Co., Buffalo, N. Y.
 Vandervort, C. B., Cincinnati, O.
 Wiggers Co., Cincinnati, O.
 Woodman, Joel H., Hoboken, N. J.
 York Wagon Gear Co., York, Pa.

BOLTS AND NUTS, SCREWS AND RIVETS.

For Carriages, Wagons and Automobiles.

American Screw Co., Providence, R. I.
 Atlas Bolt & Screw Co., Cleveland, O.
 Columbus (O.) Bolt Works.
 Kirk-Latty Mfg. Co., Cleveland, Ohio
 Milton (Pa.) Mfg. Co., The
 Russell, Burdall & Ward Bolt and Nut Co., Port Chester, N. Y.
 Skelly Co., The, Thomas P., Philadelphia, Pa.
 Upson Nut Co., Cleveland, O.

BOLT CLIPPERS

For Carriages, Wagons and Automobiles.

Carolus Mfg. Co., Sterling, Ill.
 Chambers Bros. Co., Philadelphia, Pa.
 Helwig Mfg. Co., St. Paul, Minn.
 Mummert, Wolf & Dixon Co., Hanover, Pa.
 Porter, H. K., Everett, Mass.
 Roberts Mfg. Co., Somerville, Mass.

BOOTS

A. T. A. Nelson Co., Cincinnati
 Monarch Carriage Goods Co., Cincinnati, O.

BOWS (Top)

Brown & Co., S. N., Dayton, O.
 Campbell & Dann Mfg. Co., Tullahoma, Tenn.
 Delphos Hoop Co., Delphos, O.
 Downey Bros. Spoke & Bending Co., Lancaster, Pa.
 Eureka Bending & Wheel Works, York, Pa.
 Phillip Lebzelter & Son Co., Lancaster, Pa.
 Millikan, G. W., Muncie, Ind.
 Union Bow Co., Cleveland, Ohio

BOW DRESSING MACHINE

Buob & Scheu, Cincinnati, O.

BRASS AUTO SPECIALTIES.

Jonah & George, Merrimac, Mass.
 Murphy, G. W. J., Co., Merrimac, Mass.

BRAKES

Ferrel Brake and Mfg. Co., The, Cleveland, O.
 Morgan Potter Mfg. Co., Fishkill, N. Y.

BRAKE PARTS.

Morgan Potter Mfg. Co., Fishkill, N. Y.
 Royal Equipment Co., The, Bridgeport, Conn.
 Thermold Rubber Co., Trenton, N. J.

BRUSHES AND STRIPERS

For Carriages, Wagons and Automobiles.

Clinton & Co., E., Philadelphia, Pa.
 F. W. DeVoe & C. T. Reynolds Co., N. Y. City.
 Mack, Andrew, Jonesville, Mich.
 Rodriguez, R. E., New York City
 Thum, Charles D., Philadelphia, Pa.

BUCKRAMS

Landers Bros. & Co., Toledo, O.
 Roehm & Davison, Detroit, Mich.

BUGGIES

Ames-Dean Carriage Co., Jackson, Mich.
 Babcock, H. H. & Co., Watertown, N. Y.
 Bailey & Co., S. R., Inc., Amesbury, Mass.
 Brookshire & Robinson Co., Saint Paris, O.
 Colonial Carriage Co., Circleville, O.
 Durant-Dart Carriage Co., Flint, Mich.
 Hercules Buggy Co., Evansville, Ind.
 Moyer, H. A., Syracuse, N. Y.
 Parry Mfg. Co., Indianapolis, Ind.
 Peters Buggy Co., Columbus, O.
 Aug. Schubert Wagon Co., Oneida, N. Y.
 Staver Carriage Co., Chicago, Ill.
 Studebaker Corporation, South Bend, Ind.

CARRIAGES, WAGONS AND AUTOMOBILES In the White

Keystone Vehicle Co., Reading, Pa.

Schubert Wagon Co., August, Oneida, N. Y.
 Schubert Bros. Gear Co., Oneida, N. Y.
 York (Pa.) Wagon Gear Co.

CARRIAGES Finished

(Including Buggies, Runabouts, Phaetons, Surreys, etc.)

Acorn Buggy Co., Cincinnati, O.
 Alliance Mfg. Co., Streator, Ill.
 American Carriage Co., Cincinnati, O.
 Ames Co., The F. A., Owensboro, Ky.
 Ames-Dean Carriage Co., Jackson, Mich.
 Anchor Buggy Co., Cincinnati, O.
 Ann Arbor (Mich.) Buggy Co.
 Babcock Co., H. H. Watertown, N. Y.
 Bailly & Co., S. E., Lancaster, Pa.
 Bailey & Co., S. R., Amesbury, Mass.
 Banner Buggy Co., The, St. Louis, Mo.
 Barbour Buggy Co., South Boston, Va.
 Bimel Buggy Co., Sidney, O.
 Blount Carriage & Buggy Co., Atlanta, Ga.
 Brockway, Inc., W. N., Homer, N. Y.
 Brookshire & Robinson, Saint Paris, O.
 Brown Carriage Co., Cincinnati
 Buob & Scheu, Cincinnati, O.
 L. Burg Carriage Co., Dallas City, Ill.
 Carmichael Buggy Co., Jackson, Ga.
 Carolina Buggy Mfg. Co., Henderson, N. C.
 J. L. Clark Carriage Co., Oshkosh, Wis.
 Colonial Carriage Co., Circleville, O.
 Columbus (O.) Buggy Co.
 Connersville (Ind.) Buggy Co.
 Continental Carriage Co., Cincinnati, O.
 Deal Buggy Co., Jonesville, Mich.
 John Deere Plow Co., St. Louis, Mo.
 The Geo. Delker Co., Henderson, Ky.
 Delker Bros. Buggy Co., Henderson, Ky.
 Durant-Dart Carriage Co., Flint, Mich.
 Durham (N. C.) Buggy Co.
 Eagle Wagon Works, Auburn, N. Y.
 Eckhart Carriage Co., Auburn, Ind.
 Ellis Carriage Works, Kinston, N. C.
 Emerson Carriage Co., Rockford, Ill.
 Empire Buggy Co., Jackson, Ga.
 Empire Carriage Co., Cincinnati
 Enterprise Carriage Mfg. Co., Miamisburg, O.
 Flint Wagon Works, Flint, Mich.
 Goldsboro (N. C.) Buggy Co.
 Hackney Bros., Wilson, N. C.
 Hale Buggy Co., Anniston, Ala.
 Hardy Buggy Co., Paducah, Ky.
 Haydock Carriage Co., The T. T., Cincinnati, O.
 Hayford & Sons, Edward, Newton, N. H.
 Hercules Buggy Co., Evansville, Ind.
 Herring Buggy Co., Mansfield, O.
 High Point (N. C.) Buggy Co.
 Henry Hooker & Co., New Haven, Conn.
 A. Howard, Gallon, Ohio.
 Hughes Buggy Co., Lynchburg, Va.
 Hull Vehicle Mfg. Co., Savannah, Ga.
 Hume Carriage Co., Boston, Mass.
 Keys Bros., Council Bluffs, Ia.
 Knight Buggy Co., Inc., Franklin, Va.
 Knightstown (Ind.) Buggy Co.
 Kratzer Carriage Co., Des Moines, Iowa.
 Lane, T. W., Amesbury, Mass.
 LaPorte (Ind.) Carriage Co.
 Leonier (Ind.) Carriage Co.
 Lull Carriage Co., Kalamazoo, Mich.
 McKay Carriage Co., Grove City, Pa.
 Marshalltown (Ia.) Buggy Co.
 Martin Carriage Works, York, Pa.
 Michleau Buggy Co., Kalamazoo, Mich.

Middletown (O.) Buggy Co.
 Mifflinsburg (Pa.) Buggy Co.
 Moon Bros. Carriage Co., St. Louis, Mo.
 Moon Buggy Co., Jos. W., St. Louis, Mo.
 Moyer, H. A., Syracuse, N. Y.
 H. K. Nelson, Lena, Ill.
 Noyes Carriage Co., Elkhart, Ind.
 Owensboro (Ky.) Buggy Co.
 Oxford (N. C.) Buggy Co.
 Page Bros. Buggy Co., Marshall, Mich.
 Parker Mfg. Co., Inc., Suffolk, Va.
 Parry Mfg. Co., Indianapolis
 Paterson Co., W. A., Flint, Mich.
 Peabody Buggy Co., Fostoria, O.
 Peters Buggy Co., Columbus, O.
 Piedmont Buggy Co., Monroe, N. C.
 Poste Bros. Buggy Co., Columbus, Ohio.
 Prouty & Glass Carriage Co., Wayne, Mich.
 Queen City Carriage Co., The, Cincinnati, O.
 Ratterman & Luth, Cincinnati, Ohio.
 Regal Buggy Co., St. Louis, Mo.
 Rex Buggy Co., Connersville, Ind.
 Robinson & McGill Carriage Co., Nashville, Tenn.
 Rock Hill (S. C.) Buggy Co.
 Sanford Buggy Co., Sanford, N. C.
 Sayers & Scovill Co., Cincinnati.
 Aug. Schubert Wagon Co., Oneida, N. Y.
 Sechler Carriage & Implement Co., Moline, Ill.
 Sechler & Co., Cincinnati, O.
 Seidel Buggy Co., Richmond, Ind.
 Seidler Carriage & Imp. Co., Moline, Ill.
 Jackson G. Smith & Sons, Barnesville, Ga.
 Staver Carriage Co., Chicago.
 Storm Queen Buggy Co., Wabash, Ind.
 Studebaker Bros. Mfg. Co., So. Bend, Ind.
 Sturtevant-Larrabee Co., Birmingham, N. Y.
 Sullivan Bros., Rochester, N. Y.
 Summers Buggy Co., Barnesville, Ga.
 Taylor-Cannady Buggy Co., Oxford, N. C.
 Union City (Ind.) Carriage Co.
 Velle Carriage Co., Moline, Ill.
 Virginia Buggy Co., Franklin, Va.
 Waters & Sons, G.S., New Bern, N. C.
 Wrenn & Sons Co., Norfolk, Va.
 York Carriage Co., York, Pa.
 Youngstown Carriage & Wagon Co., Youngstown, O.
 Zimmerman Mfg. Co., Auburn, Ind.

CARRIAGE CLOTHS

See Trimming Material.

CARRIAGE FORGINGS

See Forgings.

CARRIAGE SUPPLIES Miscellaneous

Aden Mfg. Co., (oiling device), Danville, Va.
 Belmer Co., H., (rubber tire, wire, brazing sleeves, etc.), Cincinnati, O.
 Cleveland (O.) Akron Bag Co.
 Cowles & Co., C., New Haven, Conn.
 Goshen Eyelet Co., (top trimmings, etc.) Goshen, Ind.
 Higgin Mfg. Co., (trimmings) Newport, Ky.
 Metal Stamping Co., New York
 Mohawk Valley Mfg. Co., Utica, N. Y.
 Neider Co., F. A., Augusta, Ky.
 Ochsner & Sons Co., A., (auto and carriage locks) New Haven, Conn.
 Scherer & Co., Detroit, Mich.
 White, H. F., (brazing sleeves) Cincinnati, O.

CASES, TIRE AND TOOL

Gilbert Mfg. Co., New Haven, Conn.
 Merchant & Evans Co., Philadelphia, Pa.

CASTINGS

Merrimac (Mass.) Plating Wks
National Brass Mfg. Co., Roch-
ester, N. Y.

CHASSES

Gramm Motor Car Co., Lima, O.
W. H. McIntyre Co., Auburn,
Ind.

CHUCKS.

Morse Twist Drill & Mch. Co.,
New Bedford, Mass.
Onelda National Chuck Co.,
Onelda, N. Y.

CLUTCHES
Automobile

Hazard Motor Mfg. Co., Roch-
ester, N. Y.
Merchant & Evans Co., Phila-
delphia, Pa.

COACH LACE.

Bridgeport Coach Lace Co.,
Bridgeport, Conn.
Schlegel Mfg. Co., Rochester,
N. Y.
Vogt Mfg. & Coach Lace Co.,
Rochester, N. Y.

COIL SPRINGS

Wm. D. Gibson Co., Chicago,
Ill.
Raymond Mfg. Co., Corry, Pa.

COLORS

Acme White Lead & Color
Works, Detroit, Mich.
Billings-Chapin Co., Cleveland,
Ohio.
The Cincinnati (O.) Color Co.
Detroit (Mich.) White Lead Co.
F. W. Devos & C. T. Reynolds
Co., N. Y. City.
Ditzler Color Co., Detroit, Mich.
Elmendorf Varnish Co., Chic-
ago, Ill.
Felton, Sibley & Co., Inc., Phil-
adelphia, Pa.
Flint Varnish Works, Flint,
Flint, Mich.
Forbes Varnish Co., Cleveland,
Ohio.
Gidden Varnish Co., Cleveland,
Ohio.
Hildreth Varnish Co., N. Y. City.
The R. F. Johnston Paint Co.,
Cincinnati, Ohio.
Keystone Paint & Filler Co.,
Muncy, Pa.
Lowe Bros. Co., Dayton, Ohio.
Masury & Son, Brooklyn, N. Y.
Moller & Schumann Co., Brook-
lyn, N. Y.
Mound City Paint & Color Co.,
St. Louis, Mo.
Murphy Varnish Co., Newark,
N. J.
F. O. Pierce Co., N. Y. City.
Rub-on Varnish Co., Buffalo,
N. Y.
St. Louis Surfacter & Paint Co.,
St. Louis, Mo.
Sherwin-Williams Co., Cleve-
land, Ohio.
Edw. Smith & Co., N. Y. City.
Standard Varnish Works, N. Y.
City.
U. S. Varnish Co., Cincinnati,
Ohio.
Valentine & Co., 257 Broadway,
N. Y. City; 277 Dearborn St.,
Chicago, Ill.; 74 Pearl St.,
Boston, Mass.
Willey Co., C. A., Long Island
City, N. Y.

COUPLINGS

Bradley, C. C. & Son, Syracuse
N. Y.
Eccles Co., Richard (forgings)
Auburn, N. Y.
Fernald Mfg. Co., North East,
Pa.
Higin Mfg. Co., Newport, Ky.
Metal Stamping Co., New York
Scranton Forging Co., Scranton,
Pa.

CURTAIN ROLLERS AND
FIXTURES

C. Cowles & Co., New Haven,
Conn.
Horace Ervlen, Ogontz, Pa.
White Mfg. Co., Bridgeport,
Conn.

CURLED HAIR

Delany & Co., Philadelphia, Pa.
Mitchell & Co., P. R., Cincinna-
ti, O.
Woll, Peter & Sons Mfg. Co.,
Philadelphia, Pa.

COMMERCIAL MOTOR CARS

The Adams Bros. Co., Findlay,
Ohio.
American Locomotive Co., New
York City.
Anderson Electric Car Co., De-
troit, Mich.
Atlas Motor Car Co., Springfield,
Mass.
Atterbury Motor Car Co., Buf-
falo, N. Y.
Avery Company, Peoria, Ill.
H. H. Babcock Co., Watertown,
N. Y.
Bowling Green (O.) Motor Car
Co.
Brooks Motor Car Co., Sagin-
aw, Mich.
The Buckeye Mfg. Co., Ander-
son, Ind.
Cass Motor Truck Co., Port
Huron, Mich.
Chase Motor Truck Co., Syra-
cuse, N. Y.
Commercial Truck Co. of Amer-
ica, Philadelphia, Pa.
James Cunningham, Son & Co.,
Rochester, N. Y.
Decatur Motor Car Co., Decatur,
Ind.
Durant-Durt Carriage Co., Flint,
Mich.
Federal Motor Truck Co., De-
troit, Mich.
Franklin Automobile Co., Syra-
cuse, N. Y.
General Vehicle Co., Long Is-
land City, N. Y.
Geneva Wagon Co., Geneva,
N. Y.
Grabowsky Power Wagon Co.,
Detroit, Mich.
Gramm Motor Truck Co., Lima,
Ohio.
Hatfield Company, Elmira, N.Y.
Hewitt Motor Co., N. Y. City.
Hydraulic Truck Sales Co., N.
Y. City.
International Harvester Co. of
America, Chicago, Ill.
International Motor Truck Co.,
N. Y. City.
Jackson Automobile Co., Jack-
son, Mich.
Kearns Motor Car Co., Beavers-
town, Pa.
Kelly Motor Truck Co., Spring-
field, Ohio.
Knox Automobile Co., Spring-
field, Mass.
Lansden Co., Newark, N. J.
McIntyre Co., W. H., Auburn,
Ind.
Mals Motor Truck Co., Indian-
apolis, Ind.
Martin Carriage Works, York,
Pa.
Molnitor Automobile Works,
Janesville, Wis.
Motor Wagon Co., Detroit, Mich.
Peerless Motor Car Co., Cleve-
land, O.
Pierce-Arrow Motor Co., Buf-
falo, N. Y.
Schacht Motor Car Co., Cincin-
nati, O.
Schmidt Bros. Co., Chicago, Ill.
Speedwell Motor Car Co., Day-
ton, Ohio.
F. B. Stearns Co., Cleveland, O.
Studebaker Corporation, South
Bend, Ind.
Velle Motor Vehicle Co., Moline,
Ill.
The Waverly Co., Indianapolis,
Ind.

CUSHIONS

Baltimore (Md.) Buggy Top Co.
Bauer Bros. Mfg. Co., Cincin-
nati, Ohio.
Buob & Scheu, Cincinnati, O.
C. L. Dowler, Philadelphia, Pa.
Fall City Buggy Top Co., Louis-
ville, Ky.
Fischer & Metzger, Cincinnati,
Ohio.

DASHES, FENDERS, ETC.

Bennett Mfg. Co., (metal) Al-
den, N. Y.
Burling, W. G., (metal) Phila-
delphia, Pa.
Indianapolis (Ind.) Dash Co.

Keystone Sheet Metal Co., Am-
bridge, Pa.
McKinnon Dash Co., Buffalo
Peters & Herron Dash Co., Co-
lumbus, O.
Scherer & Co., H., Detroit, Mich.

DECALCOMANIE TRANS-
FERS

See Transfer Ornaments.

DRILLS

Barnes, W. F. & John Co. Rock-
ford, Ill.
Champion Blower & Forge Co.,
Lancaster, Pa.
Cincinnati-Bickford Tool Co.,
Cincinnati, O.
Cincinnati (O.) Electrical Drill
Co.
Reed Co., Francis, Worcester,
Mass.
Silver Mfg. Co., Salem, O.
Wells Bros. Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Green-
field, Mass.

DRY GOODS

See Trimmings Materials.

DUCKS

Cotton, Oiled, Enameled, Rubber
Cook's Linoleum Co., Newark,
N. J.
Humphrey's Son, R. A., Phila-
delphia, Pa.

ELECTRIC VEHICLES

S. R. Bailey & Co., Amesbury,
Mass.
Columbus (O.) Buggy Co.,
Kentucky Wagon Mfg. Co.,
Louisville, Ky.
Studebaker Corporation, South
Bend, Ind.
Waverly Co., Indianapolis, Ind.

ELECTRIC LIGHTING AND
SPECIALTIES

Gray & Davis, Amesbury, Mass.
Morse, Frank W., Boston, Mass.
Westinghouse Electric & Mfg.
Co., East Pittsburg, Pa.

ENGINES.
For Automobiles.

Bellfuss Motor Co., Lansing,
Mich.
Chas. E. Duryea Co., Saginaw,
Mich.
Falls Machine Co., Sheboygan
Falls, Wis.
Hazard Motor Mfg. Co., Roch-
ester, N. Y.
Willett Engine and Carburetor
Co., Buffalo, N. Y.

FELTS, FELT PACKING AND
WASHERS.

Booth, N. E., Brooklyn, N. Y.

FIFTH WHEELS

American Roller Bearing Fifth
Wheel Co., Brooklyn, N. Y.
Eberhard Mfg. Co., Cleveland, O.
Eccles Co., Richard, Auburn,
N. Y.
Dayton (O.) Malleable Iron Co.
Keystone Forging Co., North-
umberland, Pa.
King Fifth Wheel Co., Philadel-
phia, Pa. (roller and circle)
Millersburg Fifth Wheel Co.,
Millersburg, Pa.
Queen City Forging Co., Cin-
cinnati, O.
Wilcox Mfg. Co., D., Mechanics-
burg, Pa.

FOLDING SEATS
For Automobiles

Buffington & Co., C. A., Berk-
shire, N. Y.
Graves & Congdon Co., Ames-
bury, Mass.
Hodge & Graves Co., Amesbury,
C. P. Kimball & Co., Chicago.

FORGINGS

Atwater Mfg. Co., Southington,
Conn.
Blakeslee Forging Co., Plants-
ville, Conn.
Clapp Mfg. Co., E. D. Auburn,
N. Y.

Cleveland (O.) Hardware Co.
Columbus (O.) Bolt Works
Cortland (N.Y.) Carriage Goods
Co.
Cortland (N.Y.) Forging Co.
Crandal, Stone & Co., Bing-
hamton, N. Y.
Detroit (Mich.) Socket Co.
Diamond Forging & Mfg. Co.,
Pittsburg, Pa.
Eccles Co., Richard, Auburn,
N. Y.
Herbrand Co., Fremont, O.
Higgins Spring & Axle Co., Ra-
cine, Wis.
Indiana Forging Co., Indiana-
apolis, Ind.
Keystone Forging Co., North-
umberland, Pa.
Queen City Forging Co., Cin-
cinnati, O.
Scherer & Co., H., Detroit, Mich.
Scranton (Pa.) Forging Co.
Union (N. Y.) Forging Co.
Smith & Co., H. D., Plantsville,
Conn.
Wilcox, Mfg. Co., D., Mechan-
icsburg, Pa.

FILES AND RASPS

G. & H. Barnett Co., Philadel-
phia, Pa.
Heller Bros. Co., Newark, N. J.
Nicholson File Co., Providence,
R. I.
Stokes Bros. Mfg. Co., Free-
hold, N. J.

FRINGES

Schlegel Mfg. Co., Rochester,
N. Y.
Vogt Mfg. & Coach Lace Co.,
Rochester, N. Y.

GEARS

For Carriages, Wagons and
Automobiles.

Akron-Selle Co., Akron, O.
Fitch Gear Co., Rome, N. Y.
Frost Gear & Machine Co.,
Jackson, Mich.
Holt Bros. Mfg. Co., Concord,
N. H.
Mifflinburg Body & Gear Co.,
Mifflinburg, Pa.
Mulholland Co., Dunkirk, N.Y.
Schubert Co., Aug., Onelda, N.Y.
Schubert Bros. Gear Co., Onel-
da, N. Y.
York (Pa.) Wagon Gear Co.

GEAR WOOD

Buckeye Handle, Gear & Bend-
ing Co., Alliance, O.
Conkle Co., B. F., Junction City
Ohio
Cooper Carriage Woodwork Co.,
St. Louis, Mo.
Eureka Bending & Wheel Wks,
York, Pa.
Kimble, Andrew, Zanesville, O.
Newark (O.) Gear Wood Co.
Zanesville (O.) Gear Wood Co.

GLASS.

Shoemaker, B. H., Philadelphia

GLUE

Baeder, Adamson & Co., Phila-
delphia, Pa.
Delany & Co., Philadelphia, Pa.
Woll & Co., F. P., Frankford,
Philadelphia, Pa.

GREASE

Moore Oil Co., Cincinnati, O.

HAMMERS

E. W. Bliss & Co., Brooklyn,
N. Y.
Bradley & Son, C. C., Syracuse,
N. Y.
Davis Co., G. E., Dubuque, Ia.
Hawkeye Mfg. Co., Cedar Rap-
ids, Ia.
Kerrihard Co., Red Oak, Ia.
Long & Allstatter Co., Hamil-
ton, O.
MacGowan & Finigan Foundry
and Mach. Co., St. Louis, Mo.
Mayer Bros. Co., Mankato, Minn.
Pettingell Machine Co., Ames-
bury, Mass.
Smith, H. Collier, Detroit, Mich.
West Tire Setter Co., Roches-
ter, N. Y.

HARDWARE
Carriage, Wagon and Automobile Supplies, Etc.

Blakeslee Forging Co., Plantsville, Conn.
Chase Parker & Co., Boston, Mass.
Cleveland Hardware Co., The, Cleveland, O.
Cortland Carriage Goods Co., Cortland, N. Y.
Cortland Forging Co., Cortland, N. Y.
Cowles & Co., C., New Haven, Conn.
Crandal, Stone & Co., Binghamton, N. Y.
Dayton (O.) Malleable Iron Co. Detroit (Mich.) Socket Co.
Douglas & Lomason Co., Detroit, Mich.
Dowler, Chas. L., Philadelphia.
Doxey, N. D., Elmira, N. Y.
Eastern Brass Co., Lynn, Mass.
Eberhard Mfg. Co., Cleveland, O.
Eccles Co., R., Auburn, N. Y.
English & Mersick Co., The, New Haven, Conn.
Franke Co., C. D., Charleston, S. C.
Gerhab, Jacob, Philadelphia, Pa.
Gifford & Son., John A., New York City.
Higgin Mfg. Co., Newport, Ky.
Jonah & George, Merrimac, Mass.
Kennedy, Willing & Co., Philadelphia, Pa.
Keystone Forging Co., Northumberland, Pa.
Landers Bros. Co., Toledo, O.
McLain, Willig & Cross, New York City.
Mohawk Valley Mfg. Co., Utica, N. Y.
Nelder Co., The F. A., Augusta, Ky.
R. Milton Norris Co., Baltimore.
Norris & Sons, R. W., Baltimore, Md.
Novelty Mfg. Co., The, Waterbury, Conn.
Ochsner, A. & Sons Co., New Haven, Conn.
Payne Co., E. Scott, Baltimore.
Queen City Forging Co., Cincinnati, O.
Roehm & Davison, Detroit.
Russell, Burdall & Ward Bolt and Nut Co., Port Chester, N. Y.
Scranton (Pa.) Forging Co.
Smith & Co., Jos. N., Detroit.
Spring Cleat Co., Frankford, Philadelphia, Pa.
Union Forging Co., Union, N.Y.
Wilcox, D. Mfg. Co., Mechanicsburg, Pa.
Wing Co., The C., Amesbury, Mass.

HUB BANDERS

West Tire Setter Co., Rochester, N. Y.

HUB BLOCKS

American Wood Block Co., Delphos, O.
Brayer & King, Mt. Carmel, Ill.
Hub Mfg. Co., Jonesboro, Ark.

HUB BORING MACHINE

Moyer, H. A., Syracuse, N. Y.
Silver Mfg. Co., Salem, O.

IRON AND STEEL

Cincinnati (O.) Iron and Steel Co.
Harrow Spring Co., Kalamazoo, Mich.
Wm. Jessop & Sons, N. Y. City.
Railway Steel Spring Co., Detroit, Mich.
Union Drawn Steel Co., Beaver Falls, Pa.

JACKS

Eureka Mower Co., Utica, N.Y.

JACKS (Trestle)

Hoof & Co., J. C., Chicago, Ill.

JACK SHAFTS
For Automobiles.

(Also Gears, Sprockets, Drums, Rods.)

Frost Gear & Machine Co., Jackson, Mich.

Hazard Motor Mfg. Co., Rochester, N. Y.
Merchants & Evans Co., Philadelphia, Pa.
Muncie Gear Works, Muncie, Ind.
Timken-Detroit Axle Co., Detroit, Mich.

KNIVES (Planing)

Coes & Co., Inc., L., Worcester, Mass.

LAMPS

For Carriages, Wagons and Automobiles.

Badger Brass Mfg. Co., Kenosha, Wis.
Brown Mfg. Co., J. W., Columbus, O.
Castle Lamp Co., Amesbury, Mass.
Corcoran Lamp Co., Cincinnati
Cowles & Co., C., New Haven, Conn.
Indiana Lamp Co., Connersville, Ind.
Metropolitan Lamp Co., Newark, N. J.
Richmond (Ind.) Lamp Mfg. Co.
Rose Mfg. Co., Philadelphia, Pa.
Scoville & Peck Co., New Haven, Conn.
Victor Lamp Co., Cincinnati, O.
White Mfg. Co., Bridgeport, Conn.

LEATHER, PATENT AND ENAMELED

For Carriages, Wagons and Automobiles.

American Oak Leather Co., Cincinnati, O.
Ashtabula Hide & Leather Co., Ashtabula, O.
Bridgeport (Conn.) Patent Leather Mfg. Co.
Byron & Sons, Inc., W. D., Williamsport, Md.
Cleveland (O.) Tanning Co.
Dieffenhaller, J.V., Newark, N.J.
Eldred (Pa.) Leather Co.
McCormick & Sons, E.H., Newark, N. J.
National Leather Co., Pittsburgh, Pa.
Raser Tanning Co., Ashtabula, Ohio.
Reilly Co., John, Newark, N.J.
Reilly & Son, J. P., Newark, N.J.
Smith & Sons, L. M., Newark, N. J.
Smyth Co., Chas., Newark, N.J.
Straus & Sons, M., Newark, N.J.
Ward & Co., E. S., Newark, N.J.

LEATHER SUBSTITUTES

Fabrikoid Co., Newburg, N. Y.
Fairfield (Conn.) Rubber Co.
Keratom Co., Newark, N. J.
O'Bannon Corp., New York.
Pantasote Co., New York City.
Potter, Thos., Sons & Co., Inc., Philadelphia, Pa.
Standard Oil Cloth Co., New York City.

LEATHER MEASURING MACHINE

Tufting Machine Supply Co., Chicago, Ill.

LEATHER SPECIALTIES

Cut Leather, Leather Straps, Auto Straps.

Backstay Machine & Leather Co., Union City, Ind.
Brace Leather Goods Co., Pontiac, Mich.
Carter, G. R., Connersville, Ind.
Cincinnati (O.) Hide & Lea. Co.
Decker, J. C., Montgomery, Pa.
Nelson Co., A.T.A., Cincinnati
Springfield (Mass.) Harness Co.

LINSEED OIL

Sherwin-Williams Co., Cleveland, O.

LUMBER

Anderson-Tully Co., Memphis, Tenn.
Baker Lumber Co., Turrell, Ark.
Brown Bros. Hardwood Co., Gainesville, Fla.

Carrier Lumber & Mfg. Co., Sards, Miss.
Crane & MacMahon (hardwood) New York City.
Gardner Artificial Lumber Co., Barberton, O.
Darling Lumber Co., J.W., Cincinnati, O.
Himmelberger-Harrison Lumber Co., Cape Girardeau, Mo.
Lamb-Fish Lumber Co., Charleston, Miss.
Phillip Lebzelter & Son Co., Lancaster, Pa. (hardwood).
Long-Knight Lumber Co., Indianapolis, Ind.
Luehrmann Hardwood Lumber Co., C. F., St. Louis, Mo.
New River Lumber Co., Cincinnati, O.
Shiels & Co., C. F., Cincinnati
Three States Lumber Co., Memphis, Tenn.

MACHINERY AND TOOLS

For Carriages, Wagons and Automobiles.

American Tire Drill Co., Cincinnati, O.
Badger State Mach. Co., Janesville, Wis.
Baldwin & Brown, Inc., Richmond, Va.
Bartlett, E. E., Boston, Mass.
Bentel & Margendant Co., Hamilton, O.
Bicknell Mfg. & Supply Co., Janesville, Wis.
Bliss Co., E. W., Brooklyn, N.Y.
Bokop, Webb & Palm, Defiance, Ohio.
Boynton & Plummer, Worcester, Mass.
Buffalo (N.Y.) Forge Co.
Canedy-Otto Mfg. Co., Chicago Heights, Ill.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago (Ill.) Flexible Shaft Co.
Crescent Electric Mfg. Co., Cleveland, O.
Davis Co., G. E., Dubuque, Ia.
Defiance (O.) Machine Works.
Empire Machine Works, Mt. Morris, N. Y.
Fancher Machine Co., Baldwinville, N. Y.
Fay & Egan Co., J. A., Cincinnati, O.
Frost Gear & Machine Co., Jackson, Mich.
Heartley Machine, Variety Iron & Tool Works, Toledo, O.
Helwig Mfg. Co., St. Paul, Minn.
House Cold Tire Setter Co., St. Louis, Mo.
Long & Allstatter Co., Hamilton, O.
Lounsbery, G. H. & Sons, Cincinnati, O.
Lourie Mfg. Co., Springfield, Ill.
Massachusetts Machine Shop Co., Worcester, Mass.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pettingell Machine Co., Amesbury, Mass.
Porter, H. K., Everett, Mass.
Pugh, Job T., Philadelphia, Pa.
Rechtin Co., L. E., Cincinnati
Root Co., B. M., York, Pa.
Russell & Irwin Mfg. Co., New Britain, Conn.
Schelp, G. H., St. Louis, Mo.
Smith, H. Collier, Detroit, Mich.
Smith & Co., H. D., Plantsville, Conn.
Stow Mfg. Co., Binghamton, N. Y.
Swan Co., J., Seymour, Conn.
U. S. Electrical Tool Co., Cincinnati, O.
Wells Bros. & Co., Greenfield, Mass.
West Tire Setter Co., Rochester, N. Y.
Chas. E. Wright Co., Kenilworth, N. J.

MACHINERY
Metal Working

Bliss & Co., E.W., Brooklyn, N.Y.
Pettingell Machine Co., Amesbury, Mass.
Smith, H. Collier, Detroit, Mich.

MACHINERY

See Tire Setting Machines.
See Tufting Machines.
See Wood Working Machines.

MALLEABLES.

Dayton (O.) Malleable Iron Co.
Eberhard Mfg. Co., Cleveland, O.

MEASURING MACHINES

Tufting Machine Supply Co., Chicago, Ill.

METAL SPECIALTIES

Hoods, Tanks, Fenders, Guards

Amesbury Metal Body Co., Amesbury, Mass.
A-Z Co., The, New York City.
Burling, W. G., Philadelphia, Pa.
Janney-Steinmetz Co., Philadelphia, Pa.
Keystone Sheet Metal Co., Ambridge, Pa.
Lawson & Co., F. H., Cincinnati, O.

MONOGRAMS AND SCROLLS

Barrett, J. P., South Coventry, Conn.

MOTORS

Atlas Engine Works, Indianapolis, Ind.
Bellfuss Motor Co., Lansing, Mich.
Hazard Motor Mfg. Co., Rochester, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

MOTOR PARTS

Bridgeport (Conn.) Brass Co., The F. ... Bultman Co., Cleveland, O.
Merchant & Evans Co., Philadelphia, Pa.
Muncie (Ind.) Gear Works.
National Brass Mfg. Co., Rochester, N. Y.
Seward M. & Son Co., New Haven, Conn.

MOTOR TRUCKS

(See Commercial Motor Cars.)

MOTOR VEHICLES

Chas. E. Duryea Co., Saginaw, Mich.

MOULDINGS (Automobile)

Bridgeport (Conn.) Brass Co.
Douglas & Lomason Co., Detroit, Mich.
Jonah & George, Merrimac, Mass.
Jos. N. Smith & Co., Detroit, Mich.

MOUNTINGS

For Carriages, Wagons and Automobiles.

Baker, W. C., Amesbury, Mass.
Balzer Co., Inc., G., New York
Colgan Co., J. W., Boston, Mass.
Cowles & Co., C., New Haven, Conn.
Crowe Nameplate & Engraving Co., Chicago, Ill.
Dietz Co., R. E., New York City
Douglas & Lomason Co., Detroit, Mich.
Eastern Brass Co., Lynn, Mass.
Enterprise Brass & Plating Co., Cincinnati, O.
C. T. Ham Mfg. Co., Rochester, N. Y.
Indiana Lamp Co., Connersville, Ind.
Jonah & George, Merrimac, Mass.
Metropolitan Lamp Co., Newark, N. J.
Merrimac Plating Works, Merrimac, Mass.
Ochsner & Sons Co., A., New Haven, Conn.
Richmond (Ind.) Mfg. Co.
Searles Mfg. Co., Newark, N.J.
Smith & Co., J. N., Detroit, Mich.
White Mfg. Co., Bridgeport, Conn.

MUFFLERS (Auto)

The A. Z. Co., N. Y. City.
F. H. Lawson Co., Cincinnati, O.
Mohawk Valley Mfg. Co., Utica, N. Y.

NAME PLATES

Crowe Name Plate and Eng. Co., Chicago, Ill.
Dayton (O.) Stencil Works.
Douglas & Lomason Co., Detroit, Mich. (etched).
O'Connor, J., Cincinnati, O.
Wadsworth Eng. Co., Springfield, O.
Withers, Geo. B., Albany, N.Y.

NUTS

See Bolts.

OIL CLOTH, ETC.

For Carriages, Wagons and Automobiles.

Cook's Linoleum Co., Trenton, N. J.
Monarch Rubber and Oil Cloth Co., Philadelphia, Pa.
National India Rubber Co., Bristol R. I.
Potter, Sons & Co., Thomas, Philadelphia, Pa.
Standard Oil Cloth Co., New York City.
Taunton Oil Cloth Co., Taunton, Mass.

**OIL
For Automobiles**

Havoline Oil Co., New York City.
Moore Oil Co., Cincinnati, O.
Standard Oil Co., N. Y. City.

PAINTS

For Carriages, Wagons and Automobiles

Acme White Lead & Color Wks., Detroit, Mich.
Cincinnati (O.) Color Co., Detroit (Mich.) White Lead Works.
Devoe, F. W., & C. T. Reynolds Co., New York City
Ditzler Color Co., Detroit, Mich.
Elmendorf Varnish Co., Chicago, Ill.
Felton, Sibley & Co., Inc., Philadelphia, Pa.
Flint (Mich.) Varnish Works.
Forbes Varnish Co., Cleveland, Ohio.
Glidden Varnish Co., Cleveland Harland & Son, Wm., Buffalo.
Hildreth Varnish Co., New York
Johnston Paint Co., R. F., Cincinnati, O.
Keystone Paint & Filler Co., Muncy, Pa.
A. E. Louderback (Manders), N. Y. City.
Lowe Brothers Co., Dayton, O.
Masury & Son, Brooklyn, N. Y.
Mitchell Varnish Co., Camden, N. J.
Moller & Schumann Co., Brooklyn, N. Y.
Mound City Paint & Color Co., St. Louis, Mo.
Pierce Co., F. O., New York
Pomeroy & Fischer, New York City.
Rub-On Varnish Co., Buffalo, N. Y.
Sherwin-Williams Co., Cleveland, O.
Smith & Co., Edw., New York.
U. S. Varnish Co., Cincinnati, O.
Valentine & Co., 257 Broadway, New York; 77 Pearl St., Boston
Willey Co., C. A., Long Island City, N. Y.

PASTE

Anchor Paste Co., Baltimore, Md.
Buckeye Paste Co., Columbus, O.
Indianapolis (Ind.) Paste Co.

PLATER

Silver, Brass, Oxide and Nickel
Kuhles, Chas. A., Chicago, Ill.

POLES AND SHAFTS

Single, and Double Trees, Bars and Circles.

American Pole & Shaft Co., Cincinnati, O.
Campbell & Dann Mfg. Co., Tullahoma, Tenn.
Cartier Sons Co., A. E., Ludington, Mich.
W. H. Gillette Mfg. Co., Louisville, Ky.

Mills Ellsworth & Co., Keokuk, Ia.
Moline (Ill.) Pole & Shaft Co.
Pioneer Pole & Shaft Co., Pi-qua, O.
Sidney (O.) Mfg. Co.
Von Behren Mfg. Co., Evansville, Ind.

PONY VEHICLES

Brookshire & Robinson, Saint Paris, O.
Colfax Mfg. Co., South Bend, Ind.
Michigan Buggy Co., Kalamazoo, Mich.
Queen City Carriage Co., Cincinnati, O.

PRESSES (Arbor)

Bartlett, E. E. Boston, Mass.

PUMPS (Tire)

Bridgeport (Conn.) Brass Co.
Coe-Stapley Mfg. Co., Bridgeport, Conn.

**RADIATORS
For Automobiles**

The A. Z. Co., N. Y. City.
English & Mersick Co., New Haven, Conn.
Fedders Mfg. Works, Buffalo, Conn.
Mayo Radiator Co., New Haven, Conn.

**ROUGH STUFFS
Undercoatings, Primers, Fillers, Surfacers**

Acme White Lead & Color Wks., Detroit, Mich.
Billings-Chapelin Co., Cleveland, Ohio.
Detroit (Mich.) White Lead Co.
Ditzler Color Co., Detroit, Mich.
Flint (Mich.) Varnish Works.
R. F. Johnston Paint Co., Cincinnati, O.
Lowe Brothers Co., Dayton, O.
Moller & Schumann, Brooklyn, N. Y.
Mound City Paint & Color Co., St. Louis, Mo.
Murphy Varnish Co., Newark, N. J.
F. O. Pierce & Co., N. Y. City.
Sherwin-Williams Co., Cleveland, O.
Smith & Co., Edw., N. Y. City.
Valentine & Co., N. Y. City.
Willey Co., C. A., Long Island City, N. Y.

RAILS

Douglas & Lomason Co., Detroit, Mich.

RAILS, ETC.

See Mountings.

**RIMS
For Automobiles**

Firestone Tire & Rubber Co., Akron, O.
United Rim Co., Akron, O.

RIVETS

See Bolts

ROAD CARTS

Parry Mfg. Co., Indianapolis, Ind.

ROLLER BEARINGS

Bower Roller Bearing Co., Detroit, Mich.
Hyatt Roller Bearing Co., Detroit, Mich.
Makutchan Roller Bearing Co., Chicago, Ill.
Standard Roller Bearing Co., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

ROLLER CHAFE IRONS

Mohawk Valley Mfg. Co., Utica, N. Y.
National Roller Chafe Iron Co., West Medway, Mass.

RUBBER MATS AND MATTING

Acme Rubber Mfg. Co., Trenton, N. J.
Boston Woven Hose & Belting Co., Cambridge, Mass.
Cincinnati (O.) Rubber Mfg. Co.
Federal Rubber Mfg. Co., Milwaukee, Wis.
Mechanical Rubber Co., Cleveland, Ohio.
N. J. Car Spring & Rubber Co., Jersey City, N. J.
New York (N. Y.) Belting & Packing Co.
Peerless Rubber Mfg. Co., N. Y. City.
Thermoid Rubber Co., Trenton, N. J.
Victor Rubber Co., Springfield, Ohio.
Vorhees Rubber Mfg. Co., Jersey City, N. J.

RUBBER TIRES

Acme Rubber & Mfg. Co., Trenton, N. J.
Ajax-Grieb Rubber Co., Trenton, N. J.
Auto-Emergency Mfg. Co., Baltimore, Md.
Batavia (N. Y.) Rubber Co.
Consolidated Rubber Tire Co., New York City.
Diamond Rubber Co., Akron, O.
Empire Rubber Co., Trenton, N. J.
Federal Rubber Mfg. Co., Milwaukee, Wis.
Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., Chicopee Falls, Mass.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Imperial Rubber Mfg. Co., Canton, O.
Kelly-Springfield Tire Co., New York City
Kokomo (Ind.) Rubber Co.
Motz Tire & Rubber Co., Akron, O.
Racine Auto Tire Co., Racine, Wis.
Republic Rubber Co., Youngtown, O.
Stein Double Cushion Tire Co., Akron, O.
Swinehart Tire & Rubber Co., Akron, O.
Thermoid Rubber Co., Trenton, N. J.
United States Tire Co., New York City
Victor Rubber Co., Springfield, Ohio.

**RUBBER REPAIR STOCK
and Tire Accessories**

Federal Rubber Mfg. Co., Milwaukee, Wis.
Firestone Tire & Rubber Co., Akron, O.
Fisk Rubber Co., Chicopee Falls, Mass.
Goodyear Tire & Rubber Co., Akron, O.
Manhattan Rubber Mfg. Co., Passaic, N. J.
Miller Rubber Co., Akron, O.
Thermoid Rubber Co., Trenton, N. J.

RUBBER TIRES

Continuous and Sectional, For Trucks.

Consolidated Rubber Tire Co., New York City; same as Kelly Springfield Tire Co., New York City.

**RUBBER TIRES
Solid, for Carriages**

Consolidated Rubber Tire Co., New York City, same as Kelly Springfield Tire Co., New York City.

RUBBER TIRE PROTECTORS

Double Fabric Tire Co., Auburn, Ind.
Indiana Rubber & Insulated Wire Co., Jonesboro, Ind.
Leather Tire Goods Co., Niagara Falls, N. Y.
Queen Mfg. Co., Webster City, Iowa.
Racine Auto Tire Co., Racine, Wis.

RUBBER TIRING MACHINE

Enterprise Foundry, Harvey, Ill.
U. S. Tire Co., N. Y. City.
Victor Rubber Co., Springfield, Ohio.

SAND BANDS—AXLE PROTECTORS

Farr, Willis M., Dowagiac, Mich.

SEATS

See Bodies.

SHAFTS AND POLES

See Poles and Shafts.

SHAFT COUPLINGS

(Including Anti-Rattlers Quick-Shifters and Pole Couplings.)

Bradley & Son, C. C., Syracuse, N. Y.
Eccles Co., R. Auburn, N. Y.
Fernald Mfg. Co., No. East, Pa.
Higgin Mfg. Co., Newport, Ky.
Metal Stamping Co., Long Island City, N. Y.

SHAFT STRAPS

See Leather Specialties

SHOCK ABSORBERS

Westen Mfg. Co., Newark, N. J.

SHORT TURNING GEARS

Eadie Vehicle Gear Co., New York City

SLEIGHS

Ames-Dean Carriage Co., Jackson, Mich.
Lull Carriage Co., Kalamazoo, Mich.
Sturtevant-Larrabee Co., Binghamton, N. Y.
Sullivan Bros., Rochester, N.Y.

SLEIGH RUNNERS

Ames-Dean Carriage Co., Jackson, Mich.
Schofield & Co., Freeport, Ill.

SOCKETS (Bow)

Ashtabula (O.) Bow Socket Co.
Cleveland (O.) Hardware Co.
Cortland (N.Y.) Carriage Goods Co.
Cortland (N.Y.) Forging Co.
Detroit (Mich.) Socket Co.

SPOKE MANUFACTURERS

Blanchard Co., N. C., Spring City, Tenn.
Bimel-Ashcroft Mfg. Co., Popular Bluff, Mo.
Small Spoke Co., Corinth, Miss.
Sparta (Tenn.) Spoke Factory.
Winch Spoke Co., Branson, Mo. City, Tenn.

SPONGES AND CHAMOIS

Joseph Niehaus Co., Cincinnati.

SPRINGS

For Carriages, Wagons and Automobiles

Ansted Spring & Axle Co., Connersville, Ind.
Cleveland-Canton Spring Co., Canton, O.
Cincinnati & Hammond Spring Co., Cincinnati, O.
Delany & Son, D., Newark, N.J.
Harvey Spring Co., Racine, Wis.
Harrow Spring Co., Kalamazoo, Mich.
Hess-Pontiac Spring & Axle Co., Pontiac, Mich.
Higgins Spring & Axle Co., Racine, Wis.
Insull, Thos., Philadelphia, Pa.
Kalamazoo (Mich.) Spring & Axle Co.
Keystone Spring Works, Philadelphia, Pa.
Lewis Spring & Axle Co., Jackson, Mich.
Liggett Spring & Axle Co., Pittsburg, Pa.
Mather Spring Co., Toledo, O.
Merrill Spring Co., E. R., New York City.

Mulholland Co., Dunkirk, N. Y.
 Perfection Spring Co., Cleveland
 Rowland, Wm. & Harvey, Philadelphia, Pa.
 Scranton (Pa.) Axle & Spring Co.
 Schubert Bros. Gear Co., Onelida, N. Y.
 Sheldon Axle Co., Wilkes-Barre, Pa.
 Spring Perch Co., Bridgeport, Conn.
 Tuthill Spring Co., Chicago, Ill.
 Watertown (N. Y.) Spring Co.
 Western Spring & Axle Co., Cincinnati, O.

SPRINGS

Cushion Seat Construction.

Barber Mfg. Co., Anderson, Ind.
 D'Arcy Spring Co., Kalamazoo, Mich.
 Jackson (Mich.) Cushion Spring Co.
 Murray, Wm. A., Cincinnati, O.
 National Spring & Wire Co., Albion, Mich.
 Staples & Hanford, Newburg, N. Y.
 Trenton (N.J.) Spring Mattress Co.

STEEL WHEELS

Standard Wheel Co., Toledo, O.

SEAMLESS STEEL TUBING

Standard Wheel Co., Toledo, O.

STEPS (Rubber Covered)

Cleveland (O.) Hardware Co.
 Rubber Step Mfg. Co., Exeter, N. H.

STORAGE BATTERIES

See Batteries.

STORM BUGGIES AND STORM TOPS

Ahlbrand Carriage Co., Seymour, Ind.
 Eckhart Carriage Co., Auburn, Ind.
 Haydock Carriage Co., Cincinnati, O.
 Parry Mfg. Co., Indianapolis, Ind.
 Patterson & Son, C. R., Greenfield, O.
 Rex Buggy Co., Connersville, Ind.
 Seidel Buggy Co., Richmond, Ind.
 Storm Queen Buggy Co., Washburn, Ind.
 Studebaker Corporation, South Bend, Ind.
 Zimmerman Mfg. Co., Auburn, Ind.

STRIPING AND STENCIL WHEEL.

Uebelmesser Co., C. R., New York City.

TRIMMER'S TOOLS

C. S. Osborne & Co., Newark, N. J.

THREADS

Meyer & Co., J. C., Lowell, Mass.

TUFTING TWINES

Jno. C. Meyer & Co., Lowell, Mass.

TIRE SETTERS

Brooks Tire Machine Co., Wichita, Kas.
 House Cold Tire Setter Co., St. Louis, Mo.
 Keokuk Hydraulic Tire Setter Co., Keokuk, Iowa.
 Lourie Mfg. Co., Springfield, Ill.
 West Tire Setter Co., Rochester, N. Y.

TOOLS

See Machinery.

TOPS AND TOP PARTS

For Carriages, Wagons and Automobiles

Atlanta Automobile Top & Trimming Co., Atlanta, Ga.

Baltimore (Md.) Buggy Top Co.
 Bauer Bros. Mfg. Co., Cincinnati
 Buob & Scheu, Cincinnati, O.
 Cleveland (O.) Hardware Co.
 Crandal, Stone & Co., Binghamton, N. Y.
 Ennis, Wm. G., Charleston, S.C.
 W. H. Frank, New Rochelle, N. Y.
 Falls City Buggy Top Co., Louisville, Ky.
 Fischer & Metzger, Cincinnati
 Golde-Patent Top Mfg. Co., New York City.
 Indianapolis Dash Co., Indianapolis, Ind.
 Irwin Mfg. Co., R. J., (auto) Indianapolis, Ind.
 National Auto Top Co., New York City.
 Ohio Top Co., Cincinnati, O.
 Parry Mfg. Co., Indianapolis, Ind.
 Ritter Mfg. Co., Detroit, Mich.
 Schubert Bros. Gear Co., Onelida, N. Y.
 Schubert Wagon Co., August, Onelida, N. Y.
 Snow, N. H., Binghamton, N.Y.
 Springfield (Mass.) Harness Co. (auto)
 Troy Carriage Sun Shade Co., Troy, O.
 U. S. Wood Working Co., Buffalo, N. Y.

TOP HARDWARE

For Carriages, Wagons and Automobiles

Balzer, Co., Gus, New York City
 Cately & Etting, Cortland, N.Y.
 Cleveland (O.) Hardware Co.
 Cook Carriage Goods Co., Fostoria, O.
 Cortland (N.Y.) Carriage Goods Co.
 Cortland (N.Y.) Forging Co.
 Cowles & Co., C., New Haven, Conn.
 Crandal, Stone & Co., Binghamton, N. Y.
 Detroit (Mich.) Auto Top Fastener Co.
 Detroit (Mich.) Socket Co.
 Ervin, Horace, Ogontz, Pa.
 Higgin Mfg. Co., Newport, Ky.
 Jonah & George, Merrimac, Mass.
 Metal Stamping Co., Long Island City, N. Y.
 Murphy Co., G. W. J., Merrimac, Mass.
 Neider Co., F. A., Augusta, Ky.
 Parry & Co., A. N., Amesbury, Mass.
 Queen City Forging Co., Cincinnati, O.
 Tufting Machine Supply Co., Chicago, Ill.

TOP AND UPHOLSTERY DRESSING

Rub-on Varnish Co., Buffalo, N. Y.
 West Mfg. Co., Rockford, Ill.

TRANSFER ORNAMENTS

Meyercord Co., Chicago, Ill.
 National Decalcomania Co., Philadelphia, Pa.
 Palm-Fechteler Co., New York

TRANSMISSIONS

Falls Machine Co., Sheboygan Falls, Wis.
 Frost Gear & Machine Co., Jackson, Mich.
 Hazard Motor Mfg. Co., Rochester, N. Y.
 Merchant & Evans Co., Philadelphia, Pa.
 Muncie Gear Works, Muncie, Ind.

TRIMMING MATERIAL

Dry Goods, Cloths, Rubber Drills, Enameled Goods, Imitation Leather, etc.

For Carriages, Wagons and Automobiles

Acme Rubber Mfg. Co., Trenton, N. J.
 Albrecht Co., C. H., Cincinnati
 Alf Co., E. F., Cincinnati, O.
 Bridgeport Coach Lace Co., Bridgeport, Conn.
 Chas. H. Albrecht Co., Cincinnati, O.
 Bailey Co., G. W., Brockton, Mass.
 D. L. Carpenter & Co., Cincinnati, O.

Carr Co., F. S., Boston, Mass.
 Chase, L. C. & Co., Boston
 Cincinnati (O.) Iron & Steel Co.
 Cochran Mfg. Co., East Dedham, Mass.
 Dusenbury & Co., Inc., Louisville, N. Y.
 Derby & Co., W. E., New York
 Fabrikoid Co., Newburg, N. Y.
 and Wilmington, Del.
 Fairfield Rubber Co., Fairfield, Conn.
 Fine Woolen Co., New York
 Gifford & Son, John A., New York City.
 Keratol Co., Newark, N. J.
 Laidlaw, Jr., Wm. R., New York
 Landers Bros. Co., Toledo, O.
 Mossman, Yarnelle & Co., Ft. Wayne, Ind.
 Mutt Co., L. J., Boston, Mass.
 National Hardware Co., Cincinnati, O.
 O'Bannon Corporation, New York
 Pantasote Co., New York City.
 Roehm & Davison, Detroit, Mich.
 Rogers & Co., E. F., Philadelphia, Pa.
 Roy Woolen Co., Watervliet, N. Y.
 Scherer & Co., H., Detroit, Mich.
 Schlegel Mfg. Co., Rochester, N. Y.
 Smyth Company, C., Newark, N. J.
 Silgo Iron Store, St. Louis, Mo.
 Standard Oil Cloth Co., New York
 Tiel & Co., G. Philadelphia, Pa.
 Wiese & Co., Wm., New York
 Wing Co., C., Amesbury, Mass.

TRESTLES (Steel)

Hildreth Co., S. M., New York

TRESTLES (Folding Steel)

Frasse & Co., P. A., New York

TRUCKS

For Carriage, Wagon and Automobile Builders.

Beckert, Wm., Allegheny, Pa.

TUFTING MACHINE AND SUPPLIES

Buser-Poston Tufting Machine Co., Chillicothe, O.
 Novelty Tufting Machine Co., Chicago, Ill.

VARNISHES, PAINTS AND JAPANS

For Carriages, Wagons and Automobiles

Acme White Lead & Color Wks., Detroit, Mich.
 American Varnish Co., Chicago
 Billings-Chapin Co., Cleveland.
 Brooks & Co., C., Newark, N.J.
 Buckeye Paint & Varnish Co., Toledo, O.
 Cincinnati (O.) Color Co.
 Detroit (Mich.) White Lead Co.
 Devoe, F. W., & C. T. Reynolds Co., New York City.
 Ditzler Color Co., Detroit, Mich.
 Elmendorf Varnish Co., Chicago, Ill.
 Felton, Sibley & Co., Philadelphia, Pa.
 Flint Varnish Co., Flint, Mich.
 Forbes Varnish Co., Cleveland
 French, S. H. & Co., Philadelphia, Pa.
 Glidden Varnish Co., Cleveland
 Harland, Wm. & Son, Buffalo
 Hildreth Varnish Co., New York
 Johnston, R. F., Paint Co., Cincinnati, O.
 Keystone Paint & Filler Co., Muncie, Pa.
 Lauderbach, A. E., (Manders) New York City
 Lowe Bros. Co., Dayton, O.
 Masury & Son, J. W., New York and Chicago
 Mitchell Varnish Works, Camden, N. J.
 Moller & Schumann Co., Brooklyn, N. Y.
 Moore & Co., Benj., Cleveland
 Mound City Paint & Color Co., St. Louis, Mo.
 Murphy Varnish Co., Newark, N. J.
 Parrott Varnish Co., Bridgeport, Conn.
 Pierce Co., F. O., New York
 Pomeroy & Fischer, New York
 Rambo, Theo. G., Philadelphia

Rub-On Varnish Co., Buffalo
 St. Louis (Mo.) Surfacers and Paint Co.
 Sherwin-Williams Co., Cleveland, O.
 Edw. Smith & Co., Long Island City, N. Y.
 Standard Varnish Co., New York and Chicago.
 Stewart-Mowry Co., Chicago
 Stuhl Varnish Co., J., Philadelphia, Pa.
 Twin City Varnish Co., St. Paul, Minn.
 U. S. Varnish Co., Cincinnati, O.
 Valentine & Co., 257 Broadway, New York; 277 Dearborn St., Chicago; 74 Pearl St., Boston
 Willey Co., C. A., Hunter's Pt., L. I., New York.

VICES

Parker Co., Chas., Meriden, Conn.
 Prentiss Vise Co., N. Y. City.
 Richards-Wilcox Mfg. Co., Aurora, Ill.
 Rock Island (Ill.) Mfg. Co.
 Sargent & Co., New York City.

VEHICLES

Ames-Dean Carriage Co., Jackson, Mich.
 Babcock, H. H. & Co., Watertown, N. Y.
 Bailey & Co., S. R., Inc., Amesbury, Mass.
 Brookshire & Robinson, Saint Paris, O.
 Colonial Carriage Co., Circleville, O.
 Moyer, H. A., Syracuse, N. Y.
 Parry Mfg. Co., Indianapolis
 Peters Buggy Co., Columbus, O.
 Staver Carriage Co., Chicago
 Studebaker Corporation, South Bend, Ind.

WAGON MANUFACTURERS.

Spring, Business, Farm
 Armleder Co., Cincinnati, O.
 Auburn Wagon Co., Martinsburg, W. Va.
 Bally, S. E., & Co., Lancaster, Pa.
 Blume Wagon Works, Scranton
 Columbia (Pa.) Wagon Co.
 Durant-Dort Carriage Co., Flint, Mich.
 Finnesey & Kobler, Philadelphia, Pa.
 Florence (Ala.) Wagon Co. (farm).
 Hamburg (Pa.) Carriage Works
 Holt Bros. Mfg. Co. (heavy), Concord, N. H.
 Hoover Wagon Co., York, Pa.
 Johnson Carriage Co., Oxford, Pa.
 Kentucky Wagon Mfg. Co., (farm), Louisville, Ky.
 Martin Carriage Works, York, Pa.
 Milburn Wagon Co., Toledo, O.
 Owensboro (Ky.) Wagon Co. (farm).
 Raum, John C., & Son, Baltimore, Md.
 Rech-Marbacher Co., Philadelphia, Pa.
 Studebaker Corporation, South Bend, Ind.
 Swab Wagon Co., Elizabethtown, Pa.
 Troy (O.) Wagon Works Co. (farm).
 Winkler Bros. Mfg. Co., South Bend, Ind.

WASHERS

Carriage, Automobile and Wagon.

Gaylord Sanitary Mfg. Co., Co., Rochester, N. Y.

WASHERS (Felt)

Booth, N. E., Brooklyn, N. Y.

WASHERS (Metal)

See Bolts.

WELDING COMPOUNDS

Anti-Borax Compound Co., Ft. Wayne, Ind.
 Cortland (N.Y.) Welding Compound Co.
 Doney, N. D., Elmira, N. Y.

WELDING MACHINES

Sanford Mfg. Co., F. C., Bridgeport, Conn.

WELTS, BINDINGS AND GUIMPS

For Carriages and Automobiles

Bailey Co., G. W., Brockton, Mass.
Bauer Bros. Mfg. Co., Cincinnati, O.
Byron & Sons, W. D., Williamsport, Md.
Carter, G. R. Co., Connersville, Ind.
Casey Mfg. Co., Detroit, Mich.
Cincinnati Welt Co., Cincinnati, Ohio
Wade Mfg. Co., Brockton, Mass.

WHEELS AND WHEEL STOCK

For Carriages, Wagons and Automobiles

Archibald Wheel Co., Lawrence, Mass.
Auto Wheel Co., Lansing, Mich.
Avoca Wheel Co., Avoca, N. Y.
Baltimore Hub Wheel & Mfg. Co., Baltimore, Md.
Bimel Spoke & Auto Wheel Co., Portland, Ind.
Boob Wheel Co., Cincinnati, O.
Bookwalter Wheel Co., Miamisburg, O.
Buckeye Wheel Co., Gallon, O.
Crane & MacMahon, New York
Central City Wheel Works, Syracuse, N. Y.
Eberly & Orris Mfg. Co., Mechanicsburg, Pa.
Eureka Bending & Wheel Wks., York, Pa.
Franklin (O.) Wheel Co.
Ford & Co., Tippecanoe City, O.
Gifford & Son, John A., New York.
Hayes Wheel Co., Jackson, Mich.
Hollingsworth Wheel Co., Hagerstown, Md.
Holt Bros. Mfg. Co., Concord, N. H.
Hoopes Bros. & Darlington, West Chester, Pa.
Imperial Wheel Co., Flint, Mich.
Jones & Co., Phineas, Newark, N. J.
Louisville Wheel Co., Louisville, Ky.
Merrimack Wheel Co., Amesbury, Mass.
Mitchell Wheel Co., Miamisburg, O.

Muncie (Ind.) Wheel Co.
Ness Bros. & Co., York, Pa.
New Jersey Wheel Co., Trenton, N. J.
New Wapakoneta Wheel Co., Wapakoneta, O.
Owensboro (Ky.) Wheel Co.
Parry Mfg. Co., Indianapolis, Ind.
Pontiac (Mich.) Wheel Co.
Royer Wheel Co., Cincinnati, O.
Salisbury Wheel & Mfg. Co., Jamestown, N. Y.
Schwarz Wheel Co., Philadelphia, Pa.
Shortsville Wheel Co., Shortsville, N. Y.
Standard Wheel Co., Terre Haute, Ind.
Stevens & Co., A. E., Portland, Maine.
Stinson, Edw., Mfg. Co., Baltimore, Md.
Union City (Ind.) Wheel Co.
Wayne Wheel Co., Newark, N.Y.
Wilmington (Del.) Wheel Mfg. Co.
Zwick & Greenwald Wheel Co., Dayton, O.

WHIP SOCKETS

Eastern Brass Co., Lynn, Mass.
Scott Co., E. W., Danielson, Ct.
Searles Mfg. Co., Newark, N.J.

**WOOD STOCK
Bent Work, Etc.**

For Carriages, Wagons and Automobiles

American Veneer Co., Kenilworth, N. J.
Anchor Bending Wks., Reading, Pa.
Brown, S. N. & Co., Dayton, O.
Baltimore (Md.) Hub, Wheel & Mfg. Co.
Buckeye Handle, Gear & Bending Co., Alliance, O.
Campbell & Dann Mfg. Co., Tullahoma, Tenn.
Cartier Sons, Co., A. E., Ludington, Mich.
Cincinnati (O.) Panel Co.
Crane & MacMahon, New York
Cooper Carriage Woodwork Co., St. Louis, Mo.
Dann Bros. & Co., New Haven, Conn.
Delphos Hoop Co., Delphos, O.
Downey Bros. Spoke & Bending Co., Lancaster, Pa.
Empire Bending Works, Lancaster, Pa.
Eureka Bending & Wheel Wks., York, Pa.

Gifford & Son, John A., New York City
Holt Bros. Mfg. Co., Concord, N. H.
Hoof, J. C., Co., Chicago, Ill.
Koller & Co., J. B., Mechanicsburg, Pa.
Lebzelter & Son Co., P., Lancaster, Pa.
Leippe's Sons, Jacob A., Reading, Pa.
Michigan Veneer Co., Alpena, Mich.
Millikan, G. W., Muncie, Ind.
New Wapakoneta Wheel Co., Wapakoneta, O.
Parry Mfg. Co., Indianapolis, Ind.
Shepard & Sons, H. G., New Haven, Conn.
Skinner Bending Co., J. M., Toledo, O.
Smith & Co., Ervin, York, Pa.
Southern Wheel Stock Co., Iron-
ton, O.
Stinson Mfg. Co., E., Baltimore, Md.
Tucker Woodwork Co., Sidney, Ohio.
Von Behren Mfg. Co., Evansville, Ind.
Woodman, J. H., Hoboken, N.J.

WHEELS

Heavy, Steel Disc, Truck

Hale & Kilburn Co., Philadelphia, Pa.

WHEELS (Steel)

Standard Wheel Co., Toledo, O.

**WHIFFLETREES
Single, Double, Triple**

Diamond Forging & Mfg. Co., Pittsburg, Pa.

WHITE LEAD

Acme White Lead & Color Works., Detroit.
Detroit (Mich.) White Lead Co.
Eagle White Lead Co., Cincinnati, O.
Sherwin-Williams Co., Cleveland, O.

**WIND SHIELDS
For Automobiles**

Banker Wind Shield Co., Pittsburg, Pa.
Kimball & Co., C. P., Chicago.
Metal Stamping Co., N. Y.; Long Island City.
National Auto Top Co., New York City

Novelty Mfg. Co., Waterbury, Conn.
Smith & Co., J. N., Detroit, Mich.
Springfield (Mass.) Harness Co.
Troy Carriage Sun Shade Co., Troy, O.

WIRE WHEELS

Mott Wheel Works, Utica, N.Y.
Weston & Mott, Flint, Mich.

WOOD WOOL

Michigan Veneer Co., Alpena, Mich.

WOODWORKING MACHINERY

Badger State Machine Co., Janesville, Wis.
Barnes, W. F. & John Co., Rockford, Ill.
Bentel-Margedant Co., Hamilton, O.
Bicknell Mfg. & Supply Co., Janesville, Wis.
Cordesman-Rechtin Co., Cincinnati, O.
Cordesman-Meyer Co., Cincinnati, O.
Crescent Machine Co., Leetonia, Ohio.
Defiance Machine Works, Defiance, O.
Empire Machine Works, Mt. Morris, N. Y.
Falls Machine Co., Sheboygan Falls, Wis.
Fay, J. A., & Egan Co., Cincinnati, O.
Hermance Machine Co., Williamsport, Pa.
Pettingell Machine Co., Amesbury, Mass.
Rechtin, Louis E. & Bro., Cincinnati, Ohio.
Root Co., B. M., York, Pa.
Silver Mfg. Co., Salem, O.

WRENCHES

Armstrong Mfg. Co., Bridgeport, Conn.
Bonner Mfg. Co., C. E., Champaign, Ill.
Coes Wrench Co., Worcester, Mass.
Girard Wrench Mfg. Co., Girard, Pa.
Richards-Wilcox Mfg. Co., Aurora, Ill.
Trimont Mfg. Co., Roxbury, Mass.
Whitman & Barnes Mfg. Co., Akron, O.

CLEANSING WITH SOAP

By Veteran

An auto publication says: "To prevent damage to varnished surfaces soap should be dissolved in water before using. Dissolve one pound of high grade soft oil soap to each gallon of water, and use from half pint to a full pint of this solution to each pail of wash water. Wet the car first with clean water then work with the suds and immediately rinse with hose or sponge."

I have read at different times in *The Hub* to keep all kinds of soap away from varnished material, which I believe is right. I therefore think a journal which offers the foregoing must be out of joint in its steering gear, or I think its readers are. I would be pleased with your opinion in the matter and think there are others who would also be glad to learn your opinion.

Rochester, N. Y.

Isaac J. B.

Answer.—We agree with our correspondent. *The Hub* has done so frequently. It is painfully evident the writer of the advice in the soap story is innocent of the remotest knowledge of the chemistry of either soap or varnish and therefore not competent as an educator.

"To each pound of high grade soft oil soap." The high grade soft oil soap of commerce is used chiefly among engineers for removing indurated and stubborn worn out oil from the machinery. It is made of about equal parts of potash and oil. A soft camel's hair brush moistened with this and spread over a varnished space of two inches wide (to any length) would have the effect of converting the whole matter into a soft oozy mass or compound of soap and varnish. Potash is the most powerful of all alkalies and is the chief factor in compounds for removing paints and varnishes in lieu of "burning off." One pint of the substance to one gallon of water would make the liquid compound equal: potash, 33 per cent.; fish oil, 20 per cent., and water, 57 per cent., quite strong enough to play havoc with any varnish which might be applied. Potash has an ardent desire to be absorbed by the fatty or vegetable oils. In cases where mud or street manure or other soluble material have become too hard to be removed readily soften with moderately warm water, say 80 degrees, apply gently with a sponge until it will flow off. Then go over the work with a clean sponge and rinse off and dry with a chamois skin. If any scratches appear moisten woolen cloth with crude oil and go over the scratches with it; result perfection.

[The recently introduced Vanadium chassis varnish from the Valentine & Company laboratories, has made the words of the auto journal come true, although the writer of the advice therein was not aware of it. This varnish not only defies the action of soapy water, but retains a remarkable surface and brilliancy after any amount of washing of its surface by soapy water. It is one of the most noteworthy developments in the compounding of varnish.—Ed. Hub].

SOLD MORE SLEIGHS THAN USUAL

The Belknap Wagon Works, Grand Rapids, Mich., just closed one of the most successful seasons in its history on sleighs. The Belknap specialty is heavy sleds such as are used in the lumber woods and on the farm. The season in them usually closes about Christmas, and January 1 the company found its orders practically all cleaned up. Following New Year's came the blizzard and an old fashioned winter that lasted six weeks without a break and this gave a tremendous impetus to the sleigh trade. The Belknap plant was working to capacity until the middle of February. Then unmistakable signs of a change in the weather caused a sudden letup in orders. The company has big western trade, in Washington, Oregon, Idaho, Montana and Alaska and advises from these quarters indicate that no sleighs are left in stock and that the orders for next season will be given earlier than usual and will be much above the normal. Lumber and other materials are being ordered and work on next fall stock will begin early in the summer.

REMOVING CARBON

Anyone acquainted with chemistry knows carbon is insoluble. A knowledge of this fact would make a reasoning mind sceptical concerning a preparation having for its ostensible object the dissolving out of the carbon deposit and its removal from the engine in solution, but such reasonable skepticism certainly does not justify such wild statements and wholesale condemnation of all such preparations as are frequently made.

There are successful and perfectly efficient preparations on the market which operate in a simple and understandable manner. Carbon is insoluble, so it is useless to attempt to dissolve it, but, it is capable, under the influence of heat, of entering into chemical combination with oxygen, forming carbonic oxide gas, and this property has been utilized. A combination of chemicals calculated to effect two purposes is possible, the softening of the bituminous residues, enabling the particles of carbon mixed with them to be reached and the dissipation of the carbon itself by combination with a large volume of oxygen, which is evolved from the solution in the process of treatment, and, the carbonaceous portions of the coating of deposit being dissipated and the bituminous ones consumed by the fierce heat evolved in the process, the solid particles of road dust and other foreign matters are released and are free to pass out of the exhaust in the rapid rush of the escaping gases.

The method of use is extremely simple and does not even necessarily require the use of a spanner. One cylinder is treated at a time. The flywheel is rotated until the piston of the cylinder to be dealt with is at its highest point, on the compression or firing stroke, when, of course, both valves will be closed. The chemicals are then poured into the combustion chamber—which is filled right up—either through the compression and wash-out tap, or by removing a sparking plug or valve cap and allowed to remain from an hour upwards, according to the thickness of the deposit, after which the engine is started up.

THE SELF-STARTER, THE MAGNETO

"Astounding though it may appear, the automatic engine starter, which so suddenly has attained high favor, is likely to have a direct and unlooked for influence on the use of magnetos, at least in the lower priced cars," was the declaration of an engineer who has delved deep into the mysteries of motor starters.

"Every car manufacturer who already has not adopted a self-starter, is on the hunt for one. But the available starters made at prices that permit their use on low-priced cars are of types calling for the use of a spark to ignite gas in the motor cylinders; and, as everyone knows, a magneto in a state of quiescence is of no use whatever as a spark producer. In order to retain the magneto, the car maker must either add a battery and its accessories to his ignition system, or use a more expensive type of starting device. Either course will entail an added outlay that will be serious, and so there is but one course open, apparently—to do away with the magneto and substitute a battery system for the ignition and starter. It looks just now as if this very thing would happen, and that before very long. In fact one manufacturer already has made the move."

NEW MANSFIELD COMPANY FORMED BY CHASE

B. L. Chase, president of the bankrupt Mansfield Rubber Co., of Mansfield, O., which was torn asunder in the recent arrest of Charles H. Walters, one-time vice-president and general manager of the company, has organized and incorporated the Mansfield Tire and Rubber Co., for the purpose of continuing the business. The new company is capitalized at \$300,000, and in addition to Chase, Walter F. Heene, George W. Heene, C. R. Grant and F. M. Bushnell figure as incorporators.

OPENING FOR MODERN VEHICLES IN CUBA

Although Cuban vehicles have been greatly improved during the past few years, there is ample room for the introduction of some of the latest types of American carriages, wagons, automobiles and transportation conveyances in general. Your correspondent, returned from Cuba recently, noted the aspects of domestic transportation as seen in various parts of the island. In the city of Havana, and in all of the principal thoroughfares of the country, one may find some high grade vehicles in use, most of which were imported. In the towns and along the country highways, the lack of effective transportation facilities is marked. There are numerous contrasting scenes. You will observe the crude, bulky, oxen cart struggling slowly along the roadside, while the swift up-to-date motor vehicle goes speedily by. The movers of freight in Havana have not been at all backward in getting hold of modern patterns of motor vehicle express wagons. But outside of Havana there are numerous old fashioned rigs still in use. After looking over the field quite thoroughly, your correspondent concluded that there must be a valuable and encouraging opening for the sale of modern vehicles in Cuba. There is a demand for light rigs throughout the commercial centers. There are express wagons wanted of the American type, as many of the wagons of local manufacture are rather awkward in design and heavy for the animals to haul. There are first class blacksmiths to be found in some of the larger places in Cuba, as well as shops in which a good grade of vehicles is turned out. But the lack of proper tools and devices for manufacturing a superior pattern of vehicles in Cuba is seriously felt by all engaged in the work. Hence, the inflow of imported conveyances continues to be large. No doubt, in time the carriage and wagon works of the country will be properly equipped with all of the machinery necessary for the production of a high grade of modern vehicle, in which case the manufacturers of carriages and wagons of the United States will not have the opportunity to supply the Cuban vehicle market as at the present time.

Therefore the writer concluded that the present is a good time for the exporter of vehicles to cater to the Cuban markets. A very good way to reach the consumers in Cuba is through the commission houses. There are Americans in practically all of the leading commercial centers of the island who handle American made goods. Each of these central firms has a sub-agent in the form of an enterprising tradesman in the leading cities and towns of the island. Carriages could be seen in the rear exhibition room of certain shoe stores, as the shoe dealer was simply the agent of the main commission house of the island.

The sub-agents of the cities and towns scattered throughout Cuba in turn have their drummers out. Cuban enterprise is telling now, and business in all directions has taken a start. Some of the agents and drummers are Americans. The local agents of the towns send out their salesmen with samples of the goods. One plan involves the hauling of the vehicle for sale along in the rear of the conveyance in which the drummer is riding. The drummer goes from one party to the other who is likely to want a vehicle, until a bargain is made. Sometimes the vehicle is well spattered with mud when the buyer finally gets it, but there is no serious objection to that. The drummer simply explains that he is hauling out a sample buggy for show purposes. The buyer figures that the sample is better than the new vehicle back in the store may be, and accepts the dusty vehicle at hand.

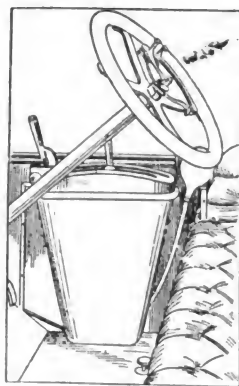
As soon as the vehicle is sold the drummer returns for another. Often he goes out with the horse attached to the rig direct and bargains off both the horse and the rig at a good price.

Another line of service for the vehicle folks of Cuba is the fitting up of conveyances for the traveling stores. Cuba is a great land for portable mercantile conveyances. The dealer in vehicles has numerous demands for second-hand carriages

or wagons refitted to carry shelves of goods and exhibit the same to the people along the wayside. The refitted conveyance is made so that shoes, confectionery, tinware, dry goods, bottled stuffs, and the like may be placed in tiers so that the articles can be seen.

If I desired to sell conveyances in Cuba I would correspond with the interested parties who deal in vehicles and do the business through them. The average Cuban tradesman is as reliable as the average tradesman of other countries. The leading dealers in goods in the cities and towns are as a rule men who have been tested and can be trusted. These men know just how to get the vehicles placed on the market to best advantage and can effect sales where you cannot. I mention this because while I was in Cuba I met a number of vehicle salesmen in the hotels in Havana who were waiting for the next boat home, claiming that they could do practically no business in Cuba. They tried to work independently of the local dealers and accomplished nothing. The individual buyers of carriages in Havana have to be taken in a certain way in order to close a bargain even if the buyer really wants a conveyance. He has to be coaxed into making the final deal. The local dealers know this, and have canes to present, and various methods adopted to get the buyer in the right mind to seal the bargain.

GEAR LEVELS WITHIN DOOR PANEL



An ingenious disposition of the control levers of automobiles having the fore-door type of body has been made. Instead of placing both levers outside or inside the panels, or placing the emergency lever outside and the gear shift inside, both levers are placed within the panel, as shown in the illustration. Thus, the straight-line effect of the body is not marred by outside levers, nor is the driver inconvenienced by having them on the inside. The tops of the levers protrude just high enough above the panel to give a firm handhold. The gate of the gear-shift lever is in the top of the panel.

A NEW AUTOMOBILE HEADLIGHT

A new headlight for the use of motorists, the invention of a Bradford man, has recently been placed on the English market. It is named the "Diva," from its similarity to a diver's headress, and its use is to be extended to apply to signaling searchlights for the army and navy. Patents have been granted in England, France, Germany, and the United States. The headlight is spherical in shape, divided into two halves vertically. The front half has a double convex lens in the center. The back half has four similar lenses, at the top, bottom, and on either side. The interior is nickel plated, and for illuminating purposes electricity is used. A bulb is placed in the exact center of the sphere, which, on being illuminated, becomes a ball of light. The rays from the four back lenses are directed onto four circular mirrors focused so as to obtain the maximum of light at an angle to throw the beams forward in a straight line parallel with that of the front lens, or otherwise as desired. The lamp is held in position by a special hinged gate or frame in front of the radiator.

The special advantages claimed are, that five times more light can be obtained from any given illuminant; there is no glare as a driver approaches and draws to one side to pass; economy of upkeep, owing to there being only one single electric bulb of small power; and the penetrative power of the light is unsurpassed for driving through fog.

A "WHITE HOUSE" SUGGESTION

In a message on foreign relations communicated to Congress on December 7 last, I expressed my belief that it would be of great value to have "some central organization in touch with the associations and chambers of commerce throughout the country, and able to keep purely American interests closely in touch with commercial affairs." This statement was prompted by suggestions that had been made from time to time by the representatives of various commercial and industrial interests in all parts of the country. These suggestions were fully confirmed by the experience of those executive branches of the Government. The plan of a broadly representative national organization so proposed by me has met with such response that I believe the time is ripe to put it to a test of practical experiment.

Such an organization properly represented at the seat of government could be of incalculable assistance in advising the executive branch of government with respect to the methods and rules to be adopted in the administration of existing law. It could be of like assistance in giving advice in regard to proposed new legislation and in counseling representatives of the executive branch when asked to submit recommendations upon bills introduced and pending before committees. Such an organization would be in the best possible position to suggest fields for new inquiry at home and abroad, the methods by which such inquiries should be pursued, and the means by which the results can be most advantageously brought to the attention of our merchants and manufacturers; and it is safe to assume that if such an organization is created its chief activities will be developed in the light of our own experience. It may not be necessary that we adopt a course in all respects patterned upon the system of any other commercial or industrial country, but it is obvious that by some means immediate relation between the government activities and the commercial and industrial forces of our country must be established if we propose to enjoy the full advantage of our opportunity in domestic and foreign trade.

I have, accordingly, instructed the Secretary of Commerce and Labor to take the necessary steps to initiate as soon as practicable at Washington a conference of delegates from organizations which are engaged in the promotion and development of commerce and industry in their respective districts, such conference to consider the establishment of a representative national organization for commercial development, and to outline the principles by which it should be governed.

(Signed) WM. H. TAFT.

NEW SPOKE AND RIM FACTORY

The Caraway Mfg. Co., with a capital of \$100,000, is the style of a new company at Nashville, Tenn., that will manufacture rims, spokes, handles, wheel strips and other wooden articles of that line. R. F. Caraway is at the head of the company.

BAUXITE AND ALUMINUM PRODUCTION

The 1910 output of bauxite in the United States was 148,932 long tons, valued at \$716,258. The average price at the mines has been: 1908, \$5.06; 1909, \$5.26; 1910, \$4.81. Bauxite is principally used in the production of metallic aluminum, and in the manufacture of the artificial abrasive, aluminum, at Niagara Falls.

The world's production of bauxite in 1909 totaled 270,581 tons, valued at \$949,924, of which the American share was 129,101 tons, worth \$679,447. The French output was 128,099 tons, worth \$215,188.

The growth and magnitude of the aluminum industry of the United States are shown in the fact that only 83 pounds were produced in 1883, 3,000 pounds in 1886, 4,000,000 pounds in

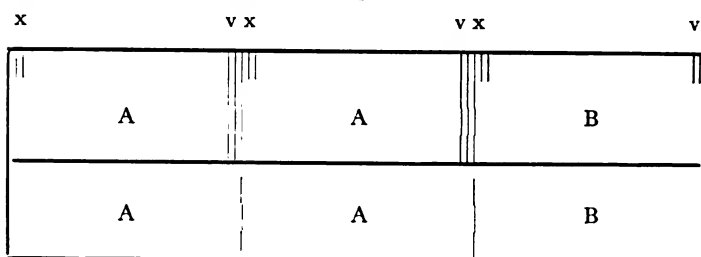
1897, 17,211,000 pounds in 1907, 34,210,000 pounds in 1909, and 47,734,000 pounds in 1910.

At the beginning of 1910 aluminum was worth 20 to 23 cents per pound for ingot metal, closing the year at 22½ cents for No. 1 ingots, with the market on the decline at the beginning of 1911.

The president of the Aluminum Co. of America states that business in 1910 fell off on account of curtailed production in steel making, in which it is used for deoxidizing and in the curtailed automobile business. "Large stocks accumulated and are still accumulating. Some plants have been cut back half and unless the demand improves still further cutting back will be necessary."

STORAGE FOR GASOLINE

Too much care cannot be practiced in the matter of gasoline. In absolute safety it is dangerous. Its power of evaporation is without equal. Its readiness to ignite or explode may possibly be equalled but not excelled. Gasoline in the building puts the insurance hazard to top notch.



The diagram shows a safe method of indoor storage, to be in remote and cool part of building. The spaces shown are lockers made with concrete party walls of 4 inches, with horizontal shelf, well stayed with heavy wire netting 6 inches thick, floor 8 inches thick, roof 6 inches thick, well stayed with wire netting. Those marked A are for 10 gallon cans. Those marked B are for two 10 gallon cans each. The marks x stand for iron pipes from the upper tier leading to the roof, with a syphon or bent top; v stands for pipes from lower tier passing through floor and roof of upper tier to roof of building. Pipes to be well cemented to prevent escape of gas; plaster of paris makes the best joint. For the small lockers use ¾-in. pipe, for large ones use 1-in. pipe.

Secure with iron doors padded with asbestos felt to prevent leaking to outside. Make the doors self-closing and locking. When removing and replacing cans, cleanse the bottom well with waste and cover the bottom lightly or thinly with a mixture of pulverized alum 5 parts, ground asbestos or talc 5 parts, plaster of paris 90 parts. This compound is absolutely fire proof.

The above precautions will reduce hazard to nearly normal.

Do not allow empty gasoline cans to stand around the shop, they generate and hold a vast amount of explosive gas. Load them up with water and place them outside the building under cover.

STROMBERG ALLEGES FLETCHER INFRINGES

Suit has been filed in the United States District Court by the Stromberg Motor Devices Company, of Chicago, against the L. V. Fletcher Company, manufacturers of the Fletcher carbureter, alleging infringement of letters patent 928,042. The particular matter in issue is what is known as the two-spring construction, described under claims 3, 4, 5 and 6 of the patent. William A. Redding is acting for the defense. The bill asks for injunction, accounting and damages and will probably be up for answer in April. For the defense it is claimed that the two-spring principle is old.

PROGRESS—IMPROVEMENT

A reduction in the cost of manufacture is the same in some respects as an increase of output. In every line of work there is a way which seems to be the best way of doing it, and consequently it has always been, and still is being done that way.

Is the old way actually the quickest? Has any one ever dissected the different movements which go to make up any particular branch of work, studying each movement, carefully timing each operation, and eliminating any superfluous movements?

In nine cases out of ten this has not been done; it may have been attempted, but was not carried far enough, or for lack of time was allowed to drop without accomplishing much.

Now, to those who have tried some scheme of shortening methods and bringing operations to a standard, and have not accomplished as much as they had anticipated, I would say, don't give up, says J. Innes in *The Wood Worker*.

I have heard men say, speaking of improving methods, that you must start at the beginning, or the place where the rough material enters the factory, and improve on each operation until the material has reached the finished state. That certainly sounds well, and would appear to be the proper way to go about things, but it will not work out unless the one endeavoring to improve has nothing else to do but stay right at the starting point until he has accomplished his improvements there, and then pass on to the next.

But while he is pondering over the array of obstacles which present themselves at the first step, there may be a gap farther down the line, where, by a few changes in the position of machines, or some other slight change, much time could be saved. Therefore do not stop at the first step, but pass along, and although you go over the entire plant several times, and cannot see any chance for improvement, yet you will, by constant study of the different motions of the workmen, the various routes which the material takes, or by the position of some particular machine, grasp an idea. This idea (although having been months, or maybe years, in arriving), when properly figured out and put into execution, may revolutionize the whole process of manufacture.

WESTERN SCHEDULE HELD UP BY INTERSTATE COMMERCE COMMISSION

Granting the petition of shippers the Interstate Commerce Commission has suspended for a period of 120 days Western Classification No. 51, which provided for numerous changes in classification of freight, rules and mixing privileges, most of which would have increased the revenues of the carriers at the expense of the public.

The new classification was slated to take effect February 15. The suspension order of the Commission provides that it shall not take effect until June 14, if at all. Before that time the classification will be the subject of exhaustive hearings and the testimony thus taken will form the basis of the Commission's decision as to which of the proposed changes shall be allowed to stand.

A point that is likely to receive considerable attention is the meaning of the term "knocked down," abbreviated in freight parlance to "K. D." Classification officials claim that shippers of various classes demand K. D. ratings on articles that should be classed as "set up," or "S. U." This was one of the bones of contention at the recent preliminary hearing held in this city. It was charged that certain implement shippers demand K. D. ratings on machines from which a few small parts have been removed and boxed, or put in bundles. In one case a manufacturer of road machinery is said to have asked for a

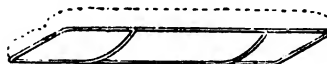
K. D. rating on a machine that is shipped set up, practically ready for use.

There is no doubt that some shippers have made unreasonable requests of the classification committees, and it is hoped that all such requests will be omitted at the coming hearings. The many just and reasonable contentions of the shippers will then appeal the more forcibly to the Commission.

The suspension of the classification until June 14 insures the continuance of the present loading rule on binder twine until the shipping season of 1912 is practically ended; for the bulk of the twine shipments will have been made by that time. And it is generally believed, even by classification officials, that the rule eliminating twine from mixture with implements at carload rates will be suspended permanently. The fate of the proposed increase in the minimum weight of straight carloads of twine is in doubt; also the proposed withdrawal of the stopping privilege.

MOTOR CAR CUSHIONS

The motor is much more severe on cushions than the buggy or carriage, therefore a different method of construction from what was formerly in vogue has had to be adopted. A motor cushion has to be soft and springy, and yet strong. They are made in two parts, the upper or stuffed portion being sewn on to an iron frame, which is afterwards placed over a frame consisting of rows of seat springs firmly secured together.



Formerly, this iron frame consisted of a piece of $\frac{3}{8}$ -in. round iron, bent to the size of the cushion, and welded together. In use this has been found to be hardly strong enough. It springs out in the center, and the cushion loses its shape. They are now being made with two cross bars welded on as in the accompanying sketch. This makes an absolutely rigid frame. The cross bars need to be swept downwards, as shown, to allow the cushion to sink evenly along its whole length.

"TWO OF A KIND" WELDING COMPOUND

Editor of *The Hub*: I copy these two formulas from a journal claiming to be away up in the technics of iron work. I am in serious doubt of their value, and would be glad of your opinion on the mixture.

No. 1

One pound powdered borax;
Two ounces black oxide manganese;
Two ounces muriate of ammonia;
Two ounces carbonate of iron;
Mix and apply to parts to be molded.

No. 2

One ounce calcined borax;
Two ounces beeswax;
Two ounces rosin;
Pulverize and mix and apply.

D. H., Chicago, Ill.

Answer—There is no question of the value of the borax in No. 1. The black oxide of manganese—20 times as much in 10 pounds of water spread over the coal—would materially aid in cooking the same. The muriate of ammonia is good for making rust joints; the carbonate of iron would serve to help fill the rubbish box.

The amount of borax in No. 2 might suffice as a flux for two welds of spring steel $1\frac{1}{2}$ inches wide. The beeswax and resin melted and mixed well make a good plaster for use in grafting apple tree seedlings, or any other purpose other than welding steel.

D. H. shows good sense when he doubts such mixtures. He is not the only one of our subscribers who have sought information on the subject.

SOMETHING ABOUT RICKSHAWS

There are two classes of rickshaws (except Japan)—first and second; the first class costing 10 cents for each mile or less, whilst the second class rate is 6 cents. The difference in the two consists in the first having rubber tires and being well upholstered, whilst the second have iron tires; also the "wallah" of the first is much swifter, a good wallah pulling a single-seated 'shaw will travel at the rate of eight miles an hour, whilst the second usually has a puller who is a novice at his work, and consequently much slower. In the first class there are single and double-seated 'shaws, but only double ones in the second class, which are largely patronized by the natives of the different countries, who have a great habit of crowding three men on the seat, and a heap of garden produce, or other marketable commodity on the floor, making a dead weight so great that it says much for the strength of the "wallah" that he can pull it at all. The "wallahs" are necessarily a fine muscular lot of men, undersized if anything, in height; but with a torso and limbs worthy of a modern Hercules.

In Japan the 'shaw is of only one class and one size, which barely holds comfortably one passenger with no superfluous avoirdupois or luggage; these 'shaws have iron tires and good springs, without which it would be impossible to travel over the bad roads of the country. The puller has neither the muscle nor the courage of his yellow brother, the Chinaman, and at the slightest rise expects his fare to engage a "push man" to push the 'shaw up the incline (plenty of the men loiter about for this job), or the passenger gets out and walks. These 'shaws are always upholstered in brown American cloth, and have hoods which are a protection from the high sun or straight falling rain, but are too flat to be of any use when the sun is not high or the rain drifts on the wind. An American cloth apron is very serviceable when waterproof; but too often this is not the case; also, often it is just too short to carry the rain outside the ledge at the front of the floor, so all the water runs in a puddle round the feet of the occupant—for, strange to say, no one ever seems to have thought of making an outlet for the water to drain off the floor. As there is only one class of 'shaw here it is well the people who ride in them are decently clean—for a man going home from work may be succeeded in the 'shaw by a smart lady going to the Emperor's garden party.

Where there are first and second class 'shaws, the first have rubber-tired wheels, and are very elaborately upholstered in a Chinese manufactured material which looks like stamped black and white velvet, or plush; over this is a white cloth stretched neatly down the back and across the seat, which can be removed in a moment and replaced by another if the wallah notices that his fare looks good for a small tip in return for the attention; but the fact that every one is usually dressed in white keeps these white covers very spotless; the scarlet mat, with which a 'shaw is always provided, gives a vivid touch of color to the 'shaw, which has a hood on the plan of the Japanese, but with more dip to the front of it, so that it is a better protection from sun and rain. This hood is very light, the slats being of bamboo, covered with thin leather; the sides and back can be rolled up, leaving plenty of air for the rider—a very great consideration in a tropical country. The 'shaw is so well balanced that no motion is felt from the wallah's steady trot, and no means of transit approaches more nearly the ideal than a good 'shaw over a good road.

CHASSIS DESIGN

In a paper on "Chassis Design," read before the Institution of Automobile Engineers by H. E. Coffin, vice-president of the Hudson Motor Car Co., the author pointed out that one of the peculiarities of the American industry was that in many things the engine was forced to strike a kind of commercial average, and he believed that in no other car-producing country had

the cars to work under such extreme conditions as in the United States.

The high-powered car was more common in the States than in England, and the tendency now was towards longer strokes.

As to new trends in design and construction in America, few cars of any power or price would go out next season without self-starters. Electric, acetylene, and compressed air self-starters were being supplied as stock equipment by several big makers. It was a question whether one of these types would ultimately supplant all others, but it was certain that the acetylene starter would be used in by far the greater numbers. As to lighting, the fears of electric competition had brought many improvements, whereby it became possible to turn on the gas lamps from the seat, and the common use of the acetylene starter seemed to argue well in favor of the retention of the gas light in combination. In the United States small tanks containing acetylene sufficient for one or two months' lighting and for 3,000 engine starts could be obtained in every village and hamlet.

There was some activity being shown in providing a substitute for the poppet valve, and one saw, in addition to the sleeve valve, rotary disc and sleeve types. The multiple disc type of clutch with cork for the friction surface was coming into use in the United States, and from his experience he could make the broad statement that the properly constructed cork-surface clutch would distance all others in smoothness of action, length of service, and freedom from trouble both in the factory and upon the road. Power tire pumps were being fitted to many cars of medium or higher price, and demountable rims were becoming almost the regular equipment of all but the very cheapest machines. There was a marked tendency towards the use of roller bearings, and the worm final drive was receiving a good deal of attention, though not so much as in England. Sheet metal, both aluminum and steel, had come to be almost universal practice for all panels in the body work, and the quantity production of bodies had brought about some wonderful press and die work for the forming of the entire front and rear panels from one sheet of metal. Demountable wood wheels had for several years been regularly fitted by American makers, but it did not seem probable that this practice would spread. Wire wheels had lost their favor; the objection to wire was one of appearance, and he doubted whether the American buyer could be soon brought to favor the lighter and stronger type.

WHY DO WHEELS DISH?

The Bimel Buggy Co. asks this question:

"Why will wheels with rubber tires gather excessive dish after being in use six months?"

Perhaps others may be curious as to the subject, so a printed reply is made.

To go back of the rubber tire period for a moment. At the beginning of each season regulation repairs comprised taking off and resetting, especially on light work.

Through use the tires received the same hammering, only in very small amounts, that iron receives in the smith shop when heated with a few blows to stretch the metal. The results consequently were the same, the tires became somewhat larger and while in use the wooden rim, because of washing, was stretched and kept the tire tight.

As soon as the wagon was laid up for a time and not washed, rims promptly shrunk, and the result was loose tires.

With the rubber, the steel channel does not come into contact with the roadway, so is not stretched, while the wood rim swells just the same, and the spokes being the point of least resistance, have to bend.

This has no bearing on quality of wheel, as the drier the wheel, the more moisture it can absorb. The only precaution that can be taken is to put the metal channel on as loose as one dares.

REVERSES DECISION OF KANSAS SUPREME COURT

The supreme court of the United States has reversed the decision of the Kansas supreme court in which it was held that a foreign corporation has no standing in Kansas courts, even in cases involving interstate commerce, until it has taken out a permit to do business under the Kansas law.

In the case decided the Wilson-Moline Buggy Company, of Moline, Ill., was plaintiff, and C. B. Hawkins, of Emporia, Kan., defendant. When the company brought suit to obtain judgment on a note, the lower court held that the plaintiff corporation had no standing because it had not taken out a charter in the state. This opinion was sustained by the supreme court of Kansas.

The case was taken on appeal to the supreme court of the United States by Bulkley, Gray & More, attorneys for the National Implement and Vehicle Association. Suit was filed nearly six years ago. The supreme court's opinion declares the Kansas law unconstitutional. A state may enact and enforce laws governing corporations which it creates, and those of other states doing business within its borders, but it cannot enforce laws which seek to control corporations doing interstate business. The sale in the case in question was made by the Kansas City agency of the Wilson-Moline Buggy Company, and the goods thus were shipped from Missouri to Kansas, making it interstate commerce.

This decision is of considerable importance to the incorporated implement and vehicle concerns, for it settles a point about which there has been much uncertainty for a number of years.

WAGON TRANSPORTATION LINE IN GUATEMALA

Guatemala has granted a concession for establishing a freight transportation service by wagons drawn by animals. The section traversed lies on one of the highest parts of the plateau in northwestern Guatemala, at an average of perhaps 8,000 feet elevation, and the mountainous nature of the country makes railroad building extremely expensive and difficult.

Some of the privileges and responsibilities embraced in the concession are as follows: Importation free of duties of the vehicles and harness on the first importation; wagons free from tax. Government freight given preference and a rebate of 50 per cent. in rates.

PRACTICAL PROBLEMS FOR VEHICLE DRAFTSMEN AND MECHANICS

What will prove to be one of the most important contributions to the recent literature of the vehicle industry has just been made by R. B. Birge and Hugh M. Sargent, two skillful exponents of the art of vehicle drafting.

These gentlemen have written and made the drawings for an authoritative book on vehicle drafting, entitled "Practical Problems for Vehicle Draftsmen and Mechanics."

Both the authors have been intimately connected with the vehicle industry, and because of their wide knowledge of carriage and automobile design and their skill in executing vehicle drawings, were selected as instructors of a class of about twenty-five pupils in the art of vehicle drafting.

As this course of instruction proceeded many practical problems came up for solution in relation to the highly technical work of the draftsman and body builder, and notes were made of all these points, these notes forming the basis for the book which Messrs. Birge and Sargent are now offering to the public.

The subject matter thus afforded covers a thorough explanation of geometry so far as it relates to the drafting of carriage and automobile bodies.

This leads to discussions and plain directions as to how to

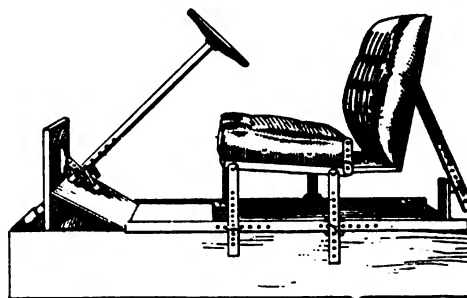
lay out sweeps and curves, ovals, and the application of the proportional triangle for laying out twisted or winding surfaces. Next the construction of joints is taken up, the laying out of proportional corners, finding the dihedral angle, etc. Coupe pillars, door framing, glass frames, wheel houses, mud guards, seat panels, and many other features of vehicle design are carefully explained and illustrated by original drawings.

Separate chapters are devoted to "Prospective Drawing of Vehicles," "Coloring Carriage and Automobile Drawings," and the book closes with a series of drafts for up-to-date automobile bodies.

The book is 9½ by 12 inches, and is bound in fine red cloth with side stamp in white. The paper used is of the highest grade, and of the most suitable kind for printing line drawings. Published by Ware Bros. Company, 1010 Arch Street, Philadelphia, Pa.

MEASURING DEVICE FITS CAR FOR ITS DRIVER

That the driving seat of an automobile be shaped and built to fit the long or short, fat or lean figure of its owner-driver is being felt to be more and more essential by automobile



manufacturers. One type of device designed to facilitate the taking of measurements is here shown. The seat bottom may be raised and lowered evenly or on a slant, the angles of the back varied, and the steering shaft shortened or lengthened.

AUTOMOBILES FAT PRODUCERS?

With their penchant for automobiles and sylphlike figures society finds itself in a quandary. The automobile creates flesh, great rolls of it. Devotees of the automobile find to their utter dismay that instead of being willowy they are fast becoming billowy, and staring them in the face is the choice of starvation or muscle racking exercise, the latter meaning, of course, less lounging in motor cars.

Dr. Finney, chief surgeon of the Johns Hopkins Hospital, declared that if the men and women of today devoted more time to golf and less to their automobiles, not only would their general health be much improved but they would not be assailed by that arch foe of the average man and woman of wealth—embonpoint.

"Those who can afford to own motor cars can well afford a saddle horse," says the doctor. "A brisk canter is worth more as a health builder than days spent in an automobile.

"There are just as many serious operations performed nowadays on women who take absolutely no exercise and spend their entire time flitting about town and country in luxuriously appointed automobiles as upon women who go to the other extreme and tear their very vitals asunder in performing feats of strength and endurance that would tax the prowess of our most skilled athletes."

Dr. Finney contends that a lethargic body will sooner or later make a lethargic brain, and vice versa. He believes that brain and muscle should work in unison, and that each should perform its full share. Both should be exercised to that point where weariness does not become too marked, and, this done, the rest of the organs will perform their functions and good health must result.

OFFICERS AND COMMITTEES OF THE C.B.N.A.

This is the authentic and official list that has just been revised and issued by the Secretary, and is important for reference:

W. H. McCurdy, President, Evansville, Ind.
Charles A. Lancaster, Chairman of Executive Committee, Merrimac, Mass.

Henry C. McLearn, Secretary and Treasurer, Mount Vernon, N. Y.
Vice-Presidents—George S. Brown, Cincinnati, O.; John L. Mason, Davenport, Ia.; M. W. Quinlan, Brookline, Mass.; D. P. Hale, Anniston, Ala.; Charles B. Hatch, New Fairfield, Conn.; S. B. Cooling, Wilmington, Del.; H. B. Staver, Chicago, Ill.; J. C. Moon, St. Louis, Mo.; J. C. Wilson, Detroit, Mich.; John E. Hayford, Newton, N. H.; John Colyer, Newark, N. J.; L. M. Fitch, Rome, N. Y.; George Hackney, Wilson, N. C.; Robert Gray, Chatham, Ont.; H. F. Keachline, Philadelphia, Pa.; Carl B. Schlamp, Henderson, Ky.; Owen Lilly, Memphis, Tenn.; Charles G. Boshier, Richmond, Va.; Carl A. Buchholz, Janesville, Wis.; S. P. Nichols, Jackson, Ga.; A. M. Parry, Indianapolis, Ind.; Clifford L. Barnett, San Francisco, Cal.; L. F. Weaver, Portland, Ore.; Jos. O. Schwartz, New Orleans, La.

Advisory Committee to the President—Charles E. Adams, Cleveland, O.; O. B. Bannister, Muncie, Ind.; W. H. Roninger, St. Louis, Mo.

Board of Trustees of Technical School—Charles J. Richter, Chairman, 119 West Seventy-third Street, New York; Hon. Franklin Murphy, Newark, N. J.; Daniel T. Wilson, New York; Wm. W. Ogden, Newark, N. J.; Wm. R. Innis, South Bend, Ind.

Committee on Freight and Classification—Theo. Luth, Chairman, Rattermann & Luth, Cincinnati, O.; W. H. Roninger, Banner Buggy Co., St. Louis, Mo.; J. D. Dort, Durant-Dort Carriage Co., Flint, Mich.; A. M. Parry, Parry Mfg. Co., Indianapolis, Ind.; John D. Craft, Hercules Buggy Co., Evansville, Ind.; E. M. Galbraith, Anchor Buggy Co., Cincinnati, O.

Advisory Committee—E. C. Meyer, Traffic Mgr., The Banner Buggy Co., St. Louis, Mo.; Charles E. Stuart, Traffic Mgr., Durant-Dort Carriage Co., Flint, Mich.; C. T. Platte, Traffic Mgr., Parry Mfg. Co., Indianapolis, Ind.; E. G. Payton, Traffic Mgr., Hercules Buggy Co., Evansville, Ind.

Committee on Abuses in the Carriage and Accessory Trades—Perrin P. Hunter, Chairman, Cincinnati, O.; Theo. Luth, Cincinnati, O.; C. C. Hull, Connersville, Ind.; Carl P. Schlamp, Henderson, Ky.; W. H. Roninger, St. Louis, Mo.; C. O. Summers, Barnesville, Ga.

Committee on the Conservation of the Resources of the Country—C. C. Hull, Chairman, Connersville, Ind.; Daniel T. Wilson, New York; H. D. Hartley, Piqua, O.; E. J. Hess, Carthage, O.; O. B. Bannister, Muncie, Ind.; Maurice Connolly, Dubuque, Ia.; James F. Taylor, Cincinnati, O.; Charles J. Forbes, Cleveland, O.; C. A. Lancaster, Merrimac, Mass.

Committee on Fire Insurance—Lewis Straus, Chairman, Newark, N. J.; K. M. Andrew, La Porte, Ind.; Charles G. Boshier, Richmond, Va.; Thomas Clark, Amesbury, Mass.; H. C. Larrabee, Binghamton, N. Y.; J. D. Cathey, St. Louis, Mo.; Joseph Aden, Danville, Va.; E. H. Brewer, Cortland, N. Y.; L. C. Cowles, New Haven, Conn.; W. C. Horr, Sidney, O.; Charles M. Peters, Columbus, O.; John D. Craft, Evansville, Ind.

Committee on Good Roads—George A. Brockway, Chairman, Homer, N. Y.; H. B. Staver, Chicago, Ill.; P. R. Doherty, Flint, Mich.; Joseph W. Moon, St. Louis, Mo.; W. P. Champney, Cleveland, O.; E. M. Galbraith, Cincinnati, O.; E. J. Hess, Carthage, O.; F. A. Ames, Owensboro, Ky.; F. B. Judkins, Merrimac, Mass.; Jos. O. Schwartz, New Orleans, La.; L. F. Weaver, Portland, Ore.; W. W. Wood, Philadelphia, Pa.; Wm. C. Clyde, Pittsburgh, Pa.; Matthew T. Gay, Newark, N. J.; S. P. Nichols, Jackson, Ga.; Robert Gray, Chatham, Ont.

Committee on New Members—Central Division—W. H. Roninger, Chairman, St. Louis, Mo.; F. A. Hastings, Chicago, Ill.; A. T. Jackson, Rockford, Ill.; L. E. Nutt, Moline, Ill.; O. B. Bannister, Muncie, Ind.; John D. Craft, Evansville, Ind.; George B. Heylmann, Noblesville, Ind.; A. M. Parry, Indianapolis, Ind.; Curlls Withrow, Connersville, Ind.; Carl D. Fischer, Terre Haute, Ind.; Robert C. Schemmel, Union City, Ind.; E. T. Yarnelle, Fort Wayne, Ind.; P. M. Ditzler, Detroit, Mich.; H. Scherer, Detroit, Mich.; J. D. Dort, Flint, Mich.; H. A. Crawford, Kalamazoo, Mich.; P. E. Ebrez, St. Louis, Mo.; Geo. M. Hoffman, St. Louis, Mo.; C. K. Reifsnider, St. Louis, Mo.; Charles E. Adams, Cleveland, O.; W. P. Champney, Cleveland, O.; W. K. Lanman, Columbus, O.; George S. Brown, Cincinnati, O.; Charles Holcker, Crestline, O.; J. H. Poste, Columbus, O.; H. Rattermann, Cincinnati, O.; W. J. Kauffman, Miamisburg, O.

Committee on New Members—Southern Division—C. O. Wrenn, Chairman, Norfolk, Va.; R. J. Corbitt, Henderson, N. C.; George Hackney, Wilson, N. C.; Thomas B. Tyson, Carthage, N. C.; C. O. Summers, Barnesville, Ga.; John McGrath, Cleveland, O.; Franklin Murphy, Jr., Newark, N. J.; Charles E. Titchener, Binghamton, N. Y.; Henry M. Shaw, Oxford, N. C.; George Stengel, Newark, N. J.; J. A. Young, Trenton, N. J.; W. A. Notman, Buffalo, N. Y.

Committee on New Members—Eastern Division—W. H. Son, Chairman, Wilkes-Barre, Pa.; R. A. Poullis, York, Pa.; A. N. Parry, Amesbury, Mass.; E. M. Galbraith, Cincinnati, O.; C. C. Bradley, Jr., Syracuse, N. Y.; George A. Brockway, Homer, N. Y.; H. F. Keachline, Philadelphia, Pa.; Isaac Cornwell, Northumberland, Pa.; L. E. Hickok, Mechanicsburg, Pa.

Committee on Press—W. W. Wood, Chairman, Philadelphia, Pa.; G. A. Tanner, New York; A. M. Ware, Philadelphia, Pa.; M. T. Richardson, New York; George W. Huston, Cincinnati, O.; C. C. Conant, Troy, N. Y.

IMITATION CELLULOID

Among patented chemical inventions, Leon Labbe registers several related methods for producing imitation celluloid which is not inflammable and whose use in automobiles—for windows, fittings, body panels and perhaps elastic tires—might be found worth considering, the fire risk of real celluloid being eliminated.

The base of the substance is gelatine or casein or both, to which is added lac or jellied silica, to increase the strength

and reduce the water-absorbing, hygronomic properties of the base. We describe two of the methods:

(1) A solution A of gelatine is prepared by heating 25 grammes of gelatine with 100 grammes of water to 65 degrees centigrade in a wet-bath. To this are added 5 grammes of acetic acid and thereafter 2 grammes of alunite. This mass is cooled preferably by artificial refrigeration, is wrapped in cheese cloth and squeezed, thereby passing through the meshes of the fabric in form of threads, which are received in a basin of water. It is then heated to 65 degrees centigrade, and 2 grammes of glycerine and 2 grammes of glucose are added. This compound is filtered. Then a solution B of lac is prepared. It can be made with alcohol, using 50 cubic centimeters of 90 degrees alcohol for 10 grammes of lac. Or it can be made with ammonia in the same proportions. It can also be made with water in the same proportions, but then some borax must be added, and the water with the borax must be preheated, whereafter the lac is added, and the whole is brought to the boiling point and filtered. The solutions A and B are now mixed, and the result, after evaporation or drying, is an imitation celluloid of fine quality and transparency.

(2) The solutions A and B are prepared as under 1. A third solution C is made of casein by adding 10 grammes of borax to 100 cubic centimeters of water, heating it, adding the casein, heating now to the boiling point and filtering. The solutions A, B and C are then mixed, and, after evaporation and drying, the compound is suitable for articles which need not be wholly transparent.

S. A. E. DISCUSSES SPEED FOR TRUCKS

When the Commercial Car Standardization Committee of the Society of Automobile Engineers met recently, William M. Kennedy, chairman of the committee, found that over 60 per cent. of the membership was present and the meeting proceeded to consider some of the vital elements in standardizing trucks.

The first matter of importance to come up for discussion was as to the method to be used in reaching conclusions touching upon the sizes and capacities from the viewpoint of the purchaser. Afterward the question of extending the inquiry for the benefit of the maker will be taken up. These questions were left open for the time being, but will be the subject of a detailed report at a later date.

It was decided that each truck should be capable of rendering normal or continuous service under its tonnage rating and that it should have an overload capacity of 25 per cent. for temporary or emergency service.

As far as maximum speed is concerned the committee favored 15 miles an hour for 1-ton trucks; 12 miles for those of 2-ton capacity; 10 miles for 3-ton trucks; 9 miles for 4-ton wagons and 8 miles an hour for cars of 5 tons capacity.

In the determining of load capacity, horsepower, drawbar pull, springs, frame, brake surface and proportional load will be considered. The figures given above represent only tentative conclusions and may be changed at a subsequent date. At the next meeting of the committee the report will be in definite shape.

NEVER-BREAK POLE CO. TO LOCATE IN OMAHA

Charles H. Seeman, president of the Never-Break Pole Co., Clarkson, Neb., says that in all probability his concern will change its factory location from Clarkson to Omaha in the very near future, on account of unfavorable railroad facilities in Clarkson. While the enterprise is hardly a year old, the necessity for a larger factory also necessitates the move and Mr. Seeman has turned to Omaha as the solution of all his difficulties, transportation and otherwise.

THE LATEST WAY

It is impossible to figure with any degree of correctness what the cost will be of hauling goods by motor trucks unless the conditions under which the work is to be done are taken into consideration. Road surfaces, grades, traffic delays, loading and unloading conditions, labor, the possibility of overloading and overspeeding, garage and repair facilities—all these and many other factors enter and are liable to completely upset any figures based upon a basis of arbitrary conditions. Even such an intangible thing as an undercurrent of sentiment inimical to power haulage may have the effect of turning the balance against the machines, as has been frequently proved by actual experience.

Considerations such as these have resulted in the planning of enterprises contemplating the sale of motor truck service rather than the sale of the vehicles themselves. The idea is to work out the cost of operation of the trucks, under average conditions, as accurately as possible, and then, using such figures as a basis, to hire out the machines at such a rate as will be profitable to the service company and economical for the user.

WILL MAKE A NEW AXLE

For the purpose of placing on the market a wagon axle, which, it is believed, incorporates enough improvements over all other axles now in existence to practically revolutionize the industry, a local organization at Bellingham, Wash., to be known as the Detachable Wagon Axle Company, has been organized by Bellingham business men and expects to have the first product on sale within the course of a week or two. Those who are interested in the new company are Wallace Cowell, George Butters, J. E. Mitchell, Swan Pearson, Lee Byles and H. Tuller. The patent is manufactured by the drop forge process, which necessitates the employment of some firm in the east at present, but as soon as the market warrants it it is probable that a factory will be constructed in Bellingham.

HOW TRAFFIC GROWS

It has been customary for a number of years to take a census of the traffic for a single day upon some principal London thoroughfares. The same day of the month has been selected as nearly as possible from year to year, so that the enumeration might be made under approximately similar conditions.

One street chosen for the census is Fleet Street, a very important thoroughfare extending from one end of the Strand to Ludgate Circus. It is a convenient and direct route to the city proper, and is traversed by several lines of omnibuses.

The increasing use of motor vans is urged in London because of the great delay that is now occasioned to motor traffic by the procession of heavy horse-drawn wide drays proceeding slowly along the principal business streets, many of which are very narrow and easily blocked.

The total motor traffic on Fleet street more than quadrupled in the four years. On the April day in 1907, 1,126 vehicles passed; in 1908, 2,073; in 1909, 2,392; in 1910, 3,884; and in 1911, 4,481.

WHAT'S THE DIFFERENCE 'TWINX MOTOR AND DYNAMO.

To explain in the simplest language, a dynamo is a machine driven by mechanical energy which converts that mechanical energy into electricity—another form of energy. A motor is a machine that takes the electrical energy generated by the dynamo and converts it back again into mechanical energy. And curiously enough, the two machines are almost identical in

their construction. Some dynamos can be operated as motors and some motors as dynamos without any change whatever.

Going a little into detail, a dynamo, or a generator, as it is now more commonly called by electrical men, is a machine consisting of what is called an armature, which is made to revolve between the poles of a magnet or group of magnets. The armature contains a great many loops of wire, which cut the lines of magnetic force which flow from one magnet pole to that of opposite polarity. Although no one can see how it is done, it is nevertheless true that this simple process causes a current of electricity to flow through the wires of the armature, which may be led out of the latter through suitable sliding contacts or brushes and set out through the conducting wires of a circuit which may extend many miles. The current is supposed, for convenience, to flow out over one wire and back over the other, keeping up a continuous flow through the armature and outside circuit.

There you have the dynamo. To operate the dynamo, mechanical energy, as that of a steam engine or water wheel, is required. The more current you take out of the armature, the harder it is to turn.

Now, if you take a machine similar to a dynamo away out somewhere on the line and connect its terminals to the two wires of the circuit, the current which is being generated by the dynamo flows through the armature of this second machine, and, lo and behold, the armature begins to spin. There you have the motor, which is nothing more than a dynamo running backwards and using up current instead of producing it. Put a pulley on the shaft of the motor and you get mechanical power again, which is what you started out with. That is why motors are so economical and convenient where mechanical power is required.

PARRY MOVEMENTS

Beginning with March, J. A. Grosscup, a veteran in the vehicle business, having been for several years a traveler in western territory, will change back to the east. He was for thirty years connected with the McFarland Carriage Company and was retained by them until they closed out their vehicle business and confined their efforts to automobiles.

Mr. J. E. Horsely, who has been connected with the office sales force for some time, goes into northwestern Iowa, where he will call on the trade during the coming season. This makes the Iowa sales force particularly strong. Mr. L. C. Rood is the veteran in the field and is constantly in charge of the Des Moines department. E. J. Rood will travel in the northeastern part of the state, Donald Goss in the southern part and J. E. Horsely in the northwestern section.

A NEW SPRING WHEEL

E. G. Owen, of Wysox, Pa., has tried his hand at a spring vehicle wheel. It is patented and it is said that the plan of bolting all the coiled springs securely at each end is new, thus obliging all the springs to work in two directions, all expanding and contracting at every revolution of the wheel, thus saving one-half the weight of the springs to carry the same load that the springs which work only on the compression plan alone carry.

Though especially designed for a friction drive device, the wheel is well adapted for use on traction axles. It is well understood that where rigid wheels are used, as they commonly are, the shock or jerk in starting and changing speed is very annoying and disagreeable. This shock is, in a great measure, absorbed by the sixteen secondary springs in this wheel, they being located parallel with and on the inner side of the rim. When the power is applied to the axle, all these springs feel it instantly, and by yielding, lessen and absorb the shock. This feature should recommend it to traction axle manufacturers, as well as its economy in manufacture and durability in use.

NEWARK INDUSTRIAL EXPOSITION

Newark is enjoying a period of remarkable industrial progress, and there will be held under the auspices of the Board of Trade a Newark Industrial Exposition.

The organization in charge will consist of a Citizens' Committee of two hundred and fifty, an Advisory Committee of sixty, and an Executive Committee of five which will direct the details of the work.

The Exposition will continue from May 13 until May 25, in the First Regiment Armory and the surrounding grounds.

The Exposition will consist principally of exhibits of manufacturers of the Newark industrial district, and processes as well as products will be shown.

The organization in part is made up of men well known in our trade. We note Hon. Franklin Murphy, Murphy Varnish Co.; Hon. James Smith, Jr., Federal Trust Co.; Marshall C. Lefferts, The Celluloid Co.; Franklin Conklin, Flood & Conklin; Charles A. Colton, Newark Technical School; Abram Rothschild, Stengel & Rothschild; John F. Conroy, E. S. Ward & Co.; Wm. B. Gwinnel, The Duranoid Manufacturing Co.

ADDITIONS TO THE GOODYEAR PLANT

The Goodyear Tire and Rubber Co. has recently made some noteworthy additions to its plant in Akron, O., in order to be ready for a greater output for the coming season. The new office building is said to be a model of convenience. The new laboratory will be completed in the early summer and another large factory building will be erected this summer. The factory is expected to have a capacity of 3,500 automobile tires, 30,000 pounds of motor truck and carriage tires and 500 motorcycle tires every day. During the past year the company has added buildings aggregating 400,000 feet of floor space, making a total of nearly 1,000,000 square feet of floor space for their 1912 operation.

WARREN MOTOR CO. DOUBLES CAPITAL

The Warren Motor Co., of Detroit, has increased its capitalization from \$300,000 to \$600,000. This decision was reached at a special stockholders' meeting held February 21, at which time Lucius E. Wilson, the retiring secretary of the Detroit Board of Commerce, was made vice-president and general manager.

A new board of directors was named and the following officers elected: President, Homer Warren; vice-president and general manager, Lucius E. Wilson; second vice-president, Charles Ritter; treasurer, C. Haines Wilson; secretary, H. W. Allen.

PROPOSED NEW FACTORY FOR LIMA

Lima, O., February 26—Preliminary consideration has been given to a proposal made by W. W. McIntyre, of Detroit, formerly of the Northern Motor Company, affiliated with the General Motors Company, to establish in Lima a \$100,000 factory to manufacture a \$500 roadster automobile and a \$900 touring car, both designed by Mr. McIntyre.

BREWSTER & CO. MOVE

Brewster & Co. have given up their lease at the southwest corner of Fifth avenue and 53d street, New York City, and taken the ground floor corner of 53d street directly opposite. The factory at Queensboro Bridge Plaza, Long Island City, being only seven or eight minutes from 5th avenue, the company finds a great proportion of its trade goes direct to the factory and the large storeroom formerly occupied as unnecessary. It is reported that Brewster & Co. sold the lease for \$100,000.

PARRY MANUFACTURING CO. CHANGES

The Parry Manufacturing Company, Indianapolis, has engaged J. A. Grosscup as representative in Nebraska. Mr. Grosscup is a veteran in the vehicle trade and has a wide acquaintance in Nebraska. For many years he was associated with the McFarlan Carriage Company.

The Parry company has also strengthened its road force in Iowa, having added J. E. Horsely to the staff. He was formerly house salesman. He will travel in northwestern Iowa, under direction of L. C. Rood, general agent at Des Moines. The Parry line is represented in northeastern Iowa by E. J. Rood and in the southern part by Donald Goss.

MARSHALLTOWN BUGGY CO. EXPANDS

The Marshalltown (Ia.) Buggy Company on February 27 voted to increase its capital stock from \$150,000 to \$200,000. Of the increased capital stock \$20,000 is to be taken by L. M. Osborne, president of the company; J. D. Humbert, of the Iowa Manufacturing Company, Des Moines, and W. A. Laybourne, of Austin, Tex. Mr. Humbert will have charge of the company's collections. Mr. Laybourne will have charge of sales in the southwest. W. A. Tuttle, who has been sales manager for Iowa, with headquarters in Des Moines, will have his headquarters at Marshalltown.

NEW FORGINGS COMPANY IN DETROIT

The Automobile Forgings Co. has been organized in Detroit under Michigan laws, with \$100,000 capital. It has taken possession of its plant, 33 Richmond St., Detroit, and is now ready for business. George W. Strelinger is president of the new company and G. W. Vandever vice-president, both of whom were connected with the Rands Mfg. Co., of Detroit, for the past seven years.

MOVING TO GRAND RAPIDS

At a meeting of the promoters of the Decatur Motor Truck Company, February 23, at Grand Rapids, Mich., the following officers were elected: President and general manager, M. E. Brackett; vice-president, E. A. Clements; secretary and treasurer, Frank T. Hulswit. A force of men is at work installing a heating system in the new plant. The machinery will be moved from Decatur to Grand Rapids.

KLAXON SUES SIMPLEX

Suit has been filed on behalf of the Lovell-MacConnell Manufacturing Company against the Simplex Motor Car Company, of Mishawaka, Ind., alleging that the automobile makers are equipping some of their cars with electric horns similar in design and appearance to the Klaxon device and infringing the patent rights of the company.

WILL CONSOLIDATE PLANTS

The Tulsa (Okla.) Automobile Company has purchased the plant and output of the Harmon Motor Truck Company of Chicago, and the two plants will be consolidated at Tulsa. Mr. Harmon becomes vice-president. The Tulsa Automobile and Manufacturing Company recently absorbed the Pioneer Automobile Company of Oklahoma City.

STEVENS-DURYEA CO. TO BUILD NEW PLANT

The Stevens-Duryea Company has acquired a 40-acre tract of land in East Springfield, Mass., and is already at work on the construction of a large new plant, part of which is expected to be in service by June.

MOIST AIR IN DRYING WOOD.

Moist air has two gases, air and the vapor of water, and consequently must hold the heat contained in both. In addition to this, there is an extra pressure created. In drying lumber, the exactly opposite condition is desired to that in drying beef. The heat should be imparted to the stick, and the drying carried on at its surface no faster than the capillary action under the force of heat brings the sap to the surface. This varies very much in the different woods, and in the rapidity that the structure allows, and in the moisture supplied, is the regulation for temperature.

Let us look for one instant where the heat begins to be applied in the raising of water into vapor and consider how much needs to be supplied. For every pound of water raised into vapor approximately 1,100 heat units are required. This, in amount, is 1,100 times as much as is required to raise a pound of water one degree, and this work has to be done before the water is converted into vapor, and water can leave the wood in no other shape in a dry kiln than in vapor. It is obvious that the heat to do this work must be taken from or supplied, in the major part, by the stick itself. If you have watched the vapor rising from the vessel on the stove, or from the river, you will note it hovers first immediately over its surface, and then is carried farther up as sufficient heat is supplied by the air to raise it. Having this in mind, we can understand how moist air and its heat does heat the lumber, allowing this rapid capillary action, evaporation and consequent rapid drying.

There is no such thing as cold. We speak of a thing as being hot and cold as to whether it is above or below the temperature of the body. The heat that may be imparted or absorbed in moist air may be shown very easily in its effect on the body. We speak of a cold, damp air and of a hot, humid air, yet the air may be of the same relative humidity, and if below, the body takes heat from it, and if above, adds to it.

Now, the air doubles its drying capacity each 25 degrees ad-

UNSATISFACTORY CARBURETORS.

There is no doubt that, on the average, the carburetor is the least satisfactory part of the present-day engines. The float-feed spray type is widely popular, but the methods of attempting to obtain a constant mixture at different engine speeds are legion. A large number of manufacturers have used carburetors with a single or double jet provided with a very small choke tube and from six inches to four times that amount of small copper pipe leading to a mixing chamber where air is added through an automatic valve. In the better examples the small pipe was water jacketed, but it was more often not so provided.

Another almost equally common design is the multi-jet arrangement, which sometimes has an automatic air valve and a mixing chamber, but perhaps more often has a positively controlled hand air admission valve connected with the throttle. The multiple jet type has gained greatly in popularity. There is also evident a strong tendency for manufacturers to adopt one of the numerous fairly satisfactory patent carburetors which are being made by specialists. The subject of the theory of carburetor action is far too large to be dealt with here, though certain interesting facts concerning the carburetors fitted to some small high-power engines have recently been published. It may be stated as an undeniable fact that very few, if any carburetors at present in use give anything at all close to a constant mixture at varying speeds, that the spring controlled automatic air valve is most difficult to deal with, and in short, that finality in carburetor design seems almost as far off as ever. Up to the present most carburetors have been the result of trial and error, the experiments being pursued till a reasonably good result was obtained, and then ceased, leaving the mechanism far from perfect. Much laboratory investigation still remains to be made, and till there is closer agreement between those who have been conducting experiments, it would be a bold man who would predict the ulti-

mate survival of any of the existing types. It may, perhaps, usefully be emphasized that the only satisfactory method of testing new carburetor designs is by means of analysis of the mixture or exhaust gas throughout the whole range of engine speed, and that nothing is more misleading than road tests, at any rate in the earlier stages of investigation. It may also safely be said that most makers are trying carburetor designs more or less haphazard, substituting almost any new type which appears to give better results than the old style. It can be noticed that this is to some extent causing makers to follow each other's procedure, though sometimes in the reverse direction, one firm taking up a type which another has dropped.

RUST PREVENTATIVE

A rust-preventing process for application to iron and steel surfaces which is said to resist the action of water and even of acid is being exploited by an English concern, the Richards Anti-Rust Syndicate, of Coventry. The metal is given a coating by boiling it in a liquid preparation for a couple of hours—more or less, according to the thickness of the coating desired—and is then treated with oil, which turns the surface black.

SOUTHERN DEALERS

The Virginia and North Carolina Association of retail implement, machinery and vehicle dealers closed a two-day session at Greensboro, N. C., February 8, with the selection of Richmond, Va., as the place for holding the next annual convention and election of S. M. Bumpass, Greensboro, president.

WILL ISSUE PREFERRED STOCK

The Milburn Wagon Company will issue \$375,000 preferred and \$625,000 common stock. Heretofore the company had common stock only. Officers elected at the annual meeting are as follows: President, H. W. Suydam; vice-president, H. R. Kelsey; secretary, F. D. Suydam, Jr.; treasurer, Frank Hafer.

TO REORGANIZE HENRY MOTOR CAR CO.

The Henry Motor Car Company, Muskegon, Mich., which went into the hands of a receiver some time ago, is being reorganized by the investment of local capital. The concern will continue business operations under the same name, it is planned.

McADAMITE METAL TO BE MADE IN DETROIT

The United States McAdamite Metal Co., of Brooklyn, N. Y., manufacturers of aluminum products for the automobile trade, is about to establish a factory in Detroit. A site with a frontage of 150 feet has been purchased at Isabella Ave. and E St., on which a steel and concrete building, 90 x 150 feet, will be erected. It is expected to be ready for occupancy on or about April 1.

THE PEORIA SHOW

The directors of the National Implement and Vehicle Show of Peoria, Ill., have selected as a permanent location the site used for the exhibition held last year. The Rock Island Railroad agreed to lay tracks to the grounds and provide ample transportation facilities; the street railway also promised to increase its facilities for handling the crowds. Permanent exhibition buildings will be erected.

Trade News From Near and Far

BUSINESS CHANGES

Haas & Stockhill have succeeded F. E. Haas in the vehicle business in Conklin, Mich.

Shenandoah (Ia.) Implement & Vehicle Co. has been sold out to J. C. Jones & Sons.

Albert Jackson has purchased the business of J. H. Bryden & Son, in Rushmore, Minn.

William Ellerbeck has purchased the stock of vehicles, etc., of H. Foster, in Ellis, Neb.

Pautsch Bros. have purchased the stock of vehicles, etc., of J. H. Tamm, in Denison, Ia.

Harry Foster has purchased the stock of vehicles, etc., of Wm. Elerbeck, in Ellis, Neb.

C. P. Disbrow is about to open a new stock of vehicles and implements in Fontanelle, Ia.

J. R. Knight has purchased the Davis & Porterfield stock of vehicles, etc., in Herndon, Kas.

Icenbice & Gilmore have succeeded to the business of Icenbice & Doty, in Deep River, Ia.

Cavanaugh & Shea have purchased the stock of vehicles, etc., of H. E. Noble, in Alva, Okla.

Watt & Parkhurst have purchased the carriage business of A. A. Johnson, in Walton, Kas.

Holtan Bros. have purchased the stock of vehicles, etc., of L. C. Osheim, in Florence, S. D.

E. C. Stewart has disposed of his stock of vehicles, etc., in Hamilton, Mo., to Chas. E. Kelly.

A. C. Robuck has purchased the stock of vehicles, etc., of McQuary & Jones, in Clarence, Mo.

W. A. Dunn, dealer in vehicles and implements at Delta, Ia., has sold out to James Hamilton, Jr.

F. B. Pennington has disposed of his stock of vehicles, etc., in Clarinda, Ia., to Frank Creighead.

Samuel Chapman has sold out his stock of buggies, etc., in Northville, S. D., to Jenkins & Reed.

D. T. Garrett has succeeded to the Finlayson-Garrett stock of vehicles, etc., in Summerfield, Kas.

J. C. Jones & Sons, of Farragut, have purchased The Shenandoah (Ia.) Implement & Vehicle Co.

A. C. Schluntz has been succeeded in the vehicle business in Rembrandt, Ia., by Ericson & Edwahl.

O. A. Brown has disposed of his stock of vehicles, etc., in Brownsville, Ore., to G. W. Mornhinweg.

C. W. Colvin has disposed of his stock of vehicles, etc., in Okmulgee, Okla., to Braunlich & Lambert.

V. A. Morgan has succeeded to the vehicle business of Farrow & Fitzsimmons, in Williamsburg, Kas.

L. A. Greiger has disposed of his stock of carriages, etc., in Sylvan, Kas., to J. B. Buttermore, of Culver.

J. R. Landham has purchased the plant of the Northeast Alabama Buggy & Wagon Co., in Anniston, Ala.

John McMillan has disposed of his implement and buggy business in Theilman, Minn., to Joseph Ramer, Jr.

A. N. Hanna & Son have purchased the stock of vehicles, etc., of the Howard Mercantile Co., in Gage, Okla.

Bowsher & Bowsher have sold their stock of implements, vehicles and harness at Lomoni, Ia., to H. W. Teale.

M. Campbell has been succeeded in the vehicle and implement business in Monticello, Ia., by Siebels & Heereen.

John J. Lutz has disposed of his stock of vehicles and hardware in Alta Vista, Kas., to F. G. Berridge, of Topeka.

Nels. Tellar, of Atkinson, Neb., has purchased the stock of buggies and implements of P. A. Krause, in Albion, Neb.

Bragg Bros. have been succeeded in the vehicle and implement business in Waukomis, Okla., by Hockaday & Roberts.

Robert P. Doze has contracted for the purchase of the Fill Garner implement and buggy business at New Sharon, Ia.

The Missoula (Mont.) Mercantile Company has absorbed the implement and vehicle business of Frank Nelson, of the same city.

Geo. Purdy has sold out his buggy and implement business in Dakota, Minn., to Ed. Baker, and will engage in business in Winona.

Packard & Stone, dealers in hardware, vehicles and implements at Edgewood, Ia., have dissolved partnership. Packard continues the hardware and vehicle business and Stone & Ellis take over the implement business.

NEW FIRMS AND INCORPORATIONS

Sherman & Roberson will open a wagon shop at Birmingham, Iowa.

J. E. Simmons has opened a new stock of buggies, etc., in Pisgah, Ia.

H. J. Giese will open a stock of vehicles, etc., in Council Bluffs, Iowa.

W. J. Tolley is about to open a new stock of buggies, etc., in Minden, Neb.

Loftus Earley will open up a stock of implements and buggies at Baxter, Ia.

Carl Johnson has engaged in the vehicle and implement business in Ong, Neb.

Searle & Howie have engaged in the vehicle business in Sioux Falls, S. D.

A. T. Whitehouse is about to open a new stock of buggies, etc., in Lisbon, N. D.

F. W. Craighead has engaged in the implement and vehicle business at Clarinda, Ia.

J. A. Jacks has engaged in the vehicle and implement business in Steele City, Neb.

Jobin & Salisbury have engaged in the vehicle and automobile business in Morris, Minn.

Bergeson Bros. have opened up a new stock of vehicles and implements in Willmar, Minn.

Floyd & Totten are preparing to open a new stock of buggies, etc., in Harrisonville, Mo.

S. C. Masters & Co., of Eagle City, Okla., are putting in a line of vehicles and implements.

Bisswell & Son are about to engage in the vehicle and implement business in St. Clair, Minn.

The White Star Buggy Co. has been incorporated in Atlanta, Ga., with a capital stock of \$5,000.

Henry Augustin is about to open a new wagon factory, with new machinery, in Oshkosh, Wis.

J. F. Dunham has just established himself in the vehicle and implement business in Moran, Kas.

The E. H. Soper Co. has just engaged in the vehicle and implement business in Greeley, Colo.

The Burns Implement Co. will engage in the implement, vehicle and auto business at Moneta, Ia.

The Golden Eagle Buggy Co. has been incorporated in Atlanta, Ga., with a capital stock of \$25,000.

Cassaway & Son, of Gracemont, Okla., have added a stock of buggies, etc., to their hardware business.

The Weber Vehicle & Implement Co. has been incorporated in Coalville, Utah, with a capital stock of \$10,000.

The John Kohl Carriage and Automobile Co., capital \$10,000, has been incorporated by John Kohl and others at Mason, Q.

The Haden-Smith Hardware Company has incorporated at Blooming Grove, Tex., with a capital of \$12,500, to carry on a retail business in implements, vehicles, harness and hardware.

Bloom-Burns Manufacturing Company, Freeport, Ill., capital, \$15,000, to manufacture vehicles and farm implements, has been incorporated by Harry G. Bloom, Walter S. Burns, Roy J. Bloom.

IMPROVEMENTS AND EXTENSIONS

The capital stock of the Farmers Handy Wagon Co., Saginaw, Mich., has been increased from \$150,000 to \$300,000.

The Kranz Carriage and Wagon Company, 3038-3042 Gravois Ave., St. Louis, Mo., will build an addition to its shop costing \$2,050.

The Burns Implement Company, Hartley, Ia., will start an implement, vehicle and automobile store at Moneta, and in addition, will carry a line of heavy hardware.

The Luverne Automobile Company stockholders, Minneapolis, Minn., have decided to increase the capital and enlarge the factory and equipment on account of improvement in business. Tentative plans are for a five-story brick addition.

Unusual interest is attached to a recent visit to San Francisco by James Couzens, treasurer of the Ford Motor Company, of Detroit, because of his recent announcement that the Ford company proposed to erect a branch factory in California to manufacture 5,000 Ford automobiles for the Pacific Coast, Island and Far Eastern trade.

FIRES

The stock of vehicles, etc., of G. B. Stewart, in Viborg, S. D., has been burned.

The carriage repository of Rhein Bros., Baltimore, Md., has been damaged by fire.

The Grolock Vehicle Material Co., of St. Louis, Mo., has suffered a severe fire loss.

Henderson Bros., carriage makers, Cambridge, Mass., suffered a fire loss on February 22.

The stock of buggies, etc., of Overture & Smock, in Ong, Neb., has been damaged by fire.

Andrew Heim's carriage and wagon works at Marinette, Wis., burned out. Loss \$14,000; insurance \$4,600.

The Western Sales Co., wholesale vehicle dealers at El Reno, Okla., suffered a fire loss of \$18,000; insurance \$5,000.

Fire destroyed the mill of the Pioneer Pole and Shaft Co., near Urbandale, Ill. The loss will approximate \$4,000.

Fire which started from spontaneous combustion in the cushion department of the Staver Carriage Company, Chicago, February 17, caused a loss of \$5,000. Automatic fire apparatus in the building prevented the destruction of the entire plant.

Several thousand dollars damage was done at the Banner Buggy Co. plant in St. Louis, February 13, when some cars on the track containing material caught fire. A fire door prevented the fire from entering the factory and doing further damage.

BUSINESS TROUBLES

A voluntary petition in bankruptcy has been filed in the federal court at Indianapolis by Clarence Hildebrand, owner of the Hildebrand Buggy Company, at Terre Haute. His liabilities are \$4,371.16 and his assets \$457.15.

INCORPORATIONS IN AUTO TRADE

Richmond, Va.—Kline Motor Car Co.

Baltimore, Md.—Everett Auto Co.; capital \$60,000.

Glasgow, Ky.—Devney Automobile Co.; capital \$50,000.

Omaha, Neb.—Arthur Storz Automobile Co.; capital \$50,000.

St. Louis, Mo.—St. Louis Alco Automobile Co.; capital \$10,000.

Milwaukee, Wis.—Hydraulic Motor Vehicle Co.; capital \$15,000.

Portland, Ore.—The Pacific Auto Manufacturing Company; capital \$150,000; no names given.

Chattanooga, Tenn.—Nyberg Auto Works; capital \$100,000; by Henry Nyberg, Z. C. Patten.

Racine, Wis.—Piggins Motor Truck Company; capital \$125,000; by C. and Fred Piggins, F. McNab.

Indianapolis, Ind.—Empire Automobile Company; capital \$100,000; by C. E. Gibson, C. B. Sommers.

Ft. Wayne, Ind.—Ft. Wayne-Auburn Auto Company; capital \$20,000; by J. M. Garmer, H. C. Hoodelmire.

Sacramento, Cal.—The Remick & Clay Company, auto firm; capital \$25,000; by Ammon Clay, J. S. Remick.

Chicago, Ill.—Available Truck Co., vehicles, and parts of same; capital \$25,000; by E. F. King, R. C. Blume.

Clyde, O.—The Krebs Commercial Car Company; capital \$100,000; by B. A. Becker, J. C. Krebs, H. Metzgar.

Lake Mills, Wis.—Lake Mills Automobile Co.; capital \$6,000; by F. A. Previtz, Adolph Yoss, Seno H. Kypke, G. H. Burns.

Bloomington, Ill.—C. U. Williams & Son Company; capital \$100,000; dealing in automobiles; by C. U. Williams, W. W. Williams.

New York—Speedwell Motor Truck & Service Co., manufacturing automobiles, etc.; capital \$50,000; by J. Friedman, Brooklyn; G. A. Randreigh, Queens.

New York—Speedwell Motor Truck & Service Co., manufacturing automobiles, etc.; capital \$50,000; by Julian Friedman, Brooklyn; Joseph R. Unlacke, Bronx.

St. Louis, Mo.—St. Louis Motor Truck Company; capital \$7,500; by Charles H. Joerding, Emily L. Haydock, Herman J. Boedeker, John P. Camp; to manufacture, buy, sell, repair and deal in automobiles, trucks, etc.

THE RUBBER TIRE TRADE

The Troy (O.) Rubber Tire Co., capital \$10,000, has been incorporated by Jacob Sweigart, Sherman LeBlond and Cyrus S. Petry, to manufacture and deal in rubber tires, machines to make, attach and detach wheel tires and other kindred machines and articles.

William Q. Cramp has been appointed manager of the new branch opened by the Kelly-Springfield Tire Co., at Buffalo, N. Y., February 1. Mr. Cramp was an officer in the Seneca Rubber Co. and moves into his new connection as a result of the Kelly-Springfield Tire Co. absorbing the Seneca Rubber Co.

The Springfield (O.) Tire and Rubber Co. have filed a certificate increasing its capital stock from \$50,000 to \$150,000.

The American Rubber Co., Akron, O., began operations about the first of March with a working force of fifty men. The company will manufacture inner and outer tubes and repair stock. The following officers were reelected: Adam Duncan, president; Gilbert C. Waltz, vice-president; F. Kryder, secretary; F. E. Rowe, assistant secretary and treasurer.

The marble sky-scraper of the United States Rubber Co., which is being erected at the corner of 58th St. and Broadway, New York, is progressing rapidly, and the company hopes to be in its new home by the first of July. The estimated cost of the building, when the plans were made, was \$750,000, and the ground lease, which runs for 21 years, is said to be \$40,000 per year.

Recently Granted Vehicle Patents

- 1,006,525—Vehicle Wheel. Albert E. Beall and C. F. Skellenger, Clinton, Iowa, assignors to Iowa Motor Wheel Co.
 1,006,465—Vehicle Wheel and Tire. Melville Clark, Chicago, Ill.
 1,006,925—Combined Steering and Propelling Means for Vehicles. Rochus Fautsch, Chicago, Ill.
 1,006,747—Automobile Radiator. James H. Graham, San Francisco.
 1,006,937—End Gate. Harvey Hall, Paonia, Col.
 1,006,656—Combined Cranking and Power Shaft. Russell Hatten, State Center, Iowa.
 1,006,941—Thill Support. Solomon B. Hays, Buchanan, Tenn.
 1,006,659—Antiskidding Device for Automobiles and Similar Vehicles. August Hormel, assignor to Hormel Auto-Appliance Co., New York, N. Y.
 1,006,555—Band Iron Tightener. Walter H. Horner, Seattle, Wash.
 1,007,032—Spring Wheel. Robert C. Jarvis, Los Angeles, Cal.
 1,006,759—Yieldable Wheel. John Klatt, Blue Earth, Minn.
 1,006,665—Cushion Tire. George H. Matteson, assignor of one-half to J. M. Hayes, Toledo, Ohio.
 1,007,041—Vehicle Seat and Lock therefor. William Miller, assignor to Amesbury Brass & Foundry Co., Amesbury, Mass.
 1,006,973—Engine of Self Propelled Vehicle or Boat. Christopher J. Montgomery, Rock Ferry, England.
 1,006,872—Spring for Vehicles. John A. Perry, assignor to The Winton Motor Carriage Co., Cleveland, O.
 1,006,683—Gas Engine Starting Device. George W. Sage, assignor of one-third to W. R. Byars, San Diego, Cal.
 1,006,686—Shock Absorber. William A. Schiller, Goodison, Mich.
 1,007,015—Tire. Thomas J. Thatcher, assignor of one-third to F. B. Thatcher and one-third to J. Gray, Detroit, Mich.
 1,007,018—Vehicle Tire. Harry Wilson and C. Guder, McKeesport, Pa.
 1,007,262—Fifth Wheel for Motor Vehicles. Daniel N. Baxter, Ardmore, Okla., assignor to D. N. Baxter, trustee, Wichita, Kas.
 1,007,332—Dump Wagon. John J. Brown, Baltimore, Md.
 1,007,333—Resilient Wheel for Vehicles. Courtland G. Capwell, Boston, assignor of thirty-seven one-hundredths to F. Ruwltzer, South Acton, and twenty-five one-hundredths to J. H. Moore, Boston, Mass.
 1,007,064—Pneumatic Tire for Wheels. Henry N. Carragher, Fall River, Mass.
 1,007,645—Automobile Running Gear. DeWitt C. Cookingham and J. H. Hertner, assignors to the Rauch and Lang Carriage Co., Cleveland, O.
 1,007,077—Spring Suspension for Vehicles. William E. Eastman, Boston, Mass.
 1,007,436—Vehicle Wheel. William Enright, Detroit, Mich.
 1,007,465—Cranking Device for Automobiles and Other Machinery. Edward A. Feiring, Plainfield, N. J.
 1,007,087—Resilient Wheel. James S. Gammon, Oklahoma, Okla.
 1,007,088—Vehicle Wheel. James S. Gammon, Lees Summit, Mo.
 1,007,094—Automobile Starter. Stonewall J. Gill, Roanoke, Va.
 1,007,201—Vehicle Spring Connection. George W. Holloway, assignor of one-half to E. A. Holloway, Gilroy, Cal.
 1,007,290—Antislipping and Cushioning Device. Charles E. Jewell, Seneca Falls, N. Y.
 1,007,120—Vehicle Spring. Charles M. Leech, Lima, Ohio.
 1,007,121—Spring Wheel. Guner B. Livingston, Burlington, N. D.
 1,007,375—Resilient Wheel. Frank Morris, Omaha, Neb.
 1,007,479—Vehicle Spring. Frederick J. Nice, Pontiac, Mich.
 1,007,608—Safety Cranking Attachment for Internal Combustion Engines. George W. Sage, San Diego, Cal.
 1,007,392—Spring Wheel. Charles Scheuner, Chicago, Ill.
 1,007,313—Automobile Suspension. Ernest Schorr, Detroit, Mich.
 1,007,394—Spare Tire Holder. Abram L. Shutter, West Haven, Conn.
 1,007,150—Fender for Automobiles. William Snyder, Rochester, N. Y.
 1,007,315—Wheel Mounting. William F. Swoveland, assignor of one-half to W. C. Felcher, Altoona, Pa.
 1,007,615—Vehicle Wheel. Franklin M. Tatum, Teneha, assignor of three-fourths to J. P. Clevenger, Nacogdoches, and one-fourth to D. B. Woods and H. E. Norris, Shelby county, Tex.
 1,007,318—Fender for Cars and Other Vehicles. John A. Wiederheim, Philadelphia, Pa.
 1,007,168—Vehicle Top. Arthur M. Wingate, Revere, Mass.
 1,007,170—Starting Device for Gas or Explosive Engines. Henry O. Wurmsler, Lorain, O.
 1,008,110—Resilient Tire. Charles W. Blake, Delaware City, Del.
 1,018,111—Resilient Tire. Charles W. Blake, Delaware City, Del.
 1,007,671—Safety Signal for Vehicles. George F. Buente, New York
 1,007,917—Shock Absorber for Vehicles. Joseph B. Burroughs, Oberlin, Ohio.
 1,008,116—Vehicle Tire and Wheel. Melville Clark, Chicago, Ill.
 1,007,673—Controlling Mechanism for Automobiles. Howard E. Coffin, assignor to W. R. Thomas, Detroit Co., Detroit, Mich.
 1,007,777—Wind Shield. Frederick A. Dillingham, assignor to the Troy Carriage Sun Shade Co., Troy, O.
 1,007,775—Safety Starting Crank for Explosive Motors. Charles R. Ellis, Stockton, Cal.
 1,007,778—Automobile Tire. DeForest L. Gates, Salamanca, N. Y.
 1,008,268—Vehicle Hub. John T. Holly, Wabbaseka, Ark.
 1,008,951—Tire. Ransom E. Olds, Lansing, Mich.
 1,007,728—Vehicle Wheel. John H. Phillips, assignor of one-half to J. H. Phillips, Jr., McKees Rocks, Pa.
 1,007,889—Tire. James B. Price, Beaumont, Tex.
 1,008,284—Wheel Tire. Domenico Ronconi, Baltimore, Md.
 1,008,083—Vehicle Wheel. Alexander B. Simpson, New York, N. Y.
 1,008,212—Motor Propelled and Other Vehicle. Norman H. Sooy, Kansas City, Mo.
 1,007,815—Forming Hollow Axles. Daniel W. Stroup, Braddock, Pa.
 1,008,090—Dirigible Lamp for Automobiles. Steve Szekely, New Brunswick, N. J.
 1,007,901—Pneumatic Spoke Wheel. Arthur H. Thibault, Seattle, Wash.
 1,008,290—Air Cushion for Vehicles. Reginald E. Vergs, Halifax, Nova Scotia, Canada.
 1,007,993—Resilient Wheel. Arthur D. Wack, St. Louis, Mo.
 1,008,224—Resilient Metallic Vehicle Wheel. William H. Wales, Jr., Norfolk, Va.
 1,008,772—Pneumatic Tire. William E. Andrew, Atlantic Highlands, N. J.
 1,008,517—Wheel. George M. and G. T. Badger, Quitman, Ga.
 1,008,688—Tire. Joseph M. Benham and G. W. Slater, Oakland, Cal.
 1,008,782—Vehicle Brake. Sidney R. Burnett, Body Camp, Va.
 1,008,792—Means for Applying Vehicle Brakes. John H. Davis, Brooklyn, assignor to Mementum Automatic Brake Co., New York.
 1,008,706—Variable Friction Driving Mechanism for Automobiles. John K. DeLoach, Bridgeport, Ala.
 1,008,962—Dirigible Lamp for Automobiles. Joe Drzequlecki, Detroit.
 1,008,805—Door for Automobiles and Other Vehicles. Fred England, assignor to Amesbury Metal Body Co., Amesbury, Mass.
 1,008,317—Axle. Pius M. Fink, Miami, Okla.
 1,008,409—Automobile Sleigh. Alexander Finkelstein, Chicago, Ill.
 1,008,713—Vehicle—James E. Grace, Detroit, Mich., assignor, by mesne assignments, to Chief Automobile Co.
 1,008,903—Whiffletree. Christ Hageseth, Jr., near Berwick, N. D.
 1,008,819—Resilient Tire. Joseph Hart, Bridgeport, assignor of one-fifth to H. L. Lewis, Stratford, Conn.
 1,008,715—Swingletree-clip. Lucy B. Hartzell, Murray, Ky.
 1,008,330—Chain Drive for Vehicles. Herman Helms, Seymour, Wis.
 1,008,422—Vehicle Spring. Louis Mayer, Mankato, Minn.
 1,008,354—Antiskidding Device for Automobiles. Robert A. Moore, Chicago, Ill.
 1,008,666—Top Attachment for Automobile. John C. Munday, Dayton, Ohio.
 1,008,612—Running Gear for Vehicles. Isaac E. Palmer, Middletown, Conn.
 1,008,373—Running Gear for Vehicles. Arthur R. Selden, assignor of one-fifth to W. D. Ellwanger, Rochester, N. Y.
 1,008,375—Spring Wheel. George A. and S. E. Siders, Delphos, Kas.
 1,008,376—Combined Steering and Driving Mechanism. Samuel E. Siders, Delphos, Kas., and G. A. Siders, Novinger, Mo.
 1,008,380—Equalizer for Dumping Wagons. James T. Snoddy, assignor to Auburn Wagon Co., Martinsburg, W. Va.
 1,008,679—Wheel. John E. Strietelmeier, assignor to the Ideal Wheel Co., Cincinnati, O.
 1,008,875—Vehicle Axle. John T. Tension, Okemah, Okla.
 1,008,573—Fastening for Demountable Rims. Charles R. Twitchell, Los Angeles, Cal.
 Copies of above patents may be obtained for fifteen cents each by addressing John A. Saul, Solicitor of Patents, Fendall Building, Washington, D. C.

RECENTLY EXPIRED PATENTS OF INTEREST TO THE VEHICLE INDUSTRY

Patents Expired January 8, 1912

- 532,030—Machine for Straightening and Setting Axles. George L. Collins, Muncie, Ind.
 532,076—Vehicle Wheel. Godfried Laube, Huron, S. D.
 532,159—Wheel. Felix Klingelhofer, London, England.
 532,189—Wheel Tire. Thomas B. Sloper, Devizes, England.
 532,216—Wagon. William O. Shadbolt, Brooklyn, N. Y.
 532,249—Thill Coupling. Lucien Rawdon, Windsor, O.
 532,251—Whiffletree. William H. Sholl and John Schneider, Valparaiso, Ind.
 532,342—Vehicle Running Gear. William A. Sayer, Glendale, O.
 532,413—Whiffletree. Lorenzo D. Brown, Shawnee, O.

Patents Expired January 15, 1912

- 532,442—Wagon Body Fastener. Clinton D. Bradshaw, Derby, Kas.
 532,466—Pneumatic Tire. Sydney Lee, London, England.
 532,488—Axle-Forging Apparatus. James Simpson, Pittsburg, Pa.
 532,641—Vehicle Brake. Horace D. Cool, Little Valley, N. Y.
 532,648—Tongue Support. Abraham Doran and George B. Gochenouer, Burket, Ind.
 532,649—Carriage. William F. Downey, Washington, D. C.
 532,654—Combined Anvil and Vise. Fay O. Farwell, Dubuque, Ia.
 532,726—Buggy-top Support. Charles Deplanty, Coffeyville, Kas.

Patents Expired January 22, 1912

- 532,866—Wheel Rim. Charles D. Brown, Dayton, O.
 532,879—Wheel Tire. Robert E. Humphreys, Irwin, Pa.
 532,885—Whiffletree Clip. Franklin Leonard, Bridgewater, N. Y.
 532,906—Harness. Charles A. Rahn, Cleveland, O.
 532,942—Wheel Tire. Charles Bivort and Jean Nadler, Paris, France.
 532,948—Thill Coupling. George F. Cope, Hilton, N. J.
 352,967—Wagon Step. William B. Kelley and Samuel P. Kelley, College Hill, Ky.
 532,996—Thill Coupling. James T. Welch and David A. Dreyfuss, L'Argentine Landing, La.

Patents Expired January 29, 1912

- 533,057—Carriage Spring. Thomas B. Dowley, Owen Sound, Canada.
 533,082—Vehicle Shaft Supporter. Henry K. Porter and Fred V. Wooster, Boston, Mass.
 533,116—Wagon Bolster Stake. Alexis Conrad, North La Crosse, Wis.
 533,251—Pneumatic Tire. Alexander Straus, New York, N. Y.
 533,332—Vehicle Running Gear. George T. Wilson, Moline, Ill.
 533,341—Wheel Hub. Homer L. Boyle, Grand Rapids, Mich.
 533,344—Vehicle Spring. Arthur W. Burdick, Fresno, Cal.
 533,377—Wagon Brake. Douglas Shannon, La Delle, S. D.
 533,405—Road Vehicle. Arthur M. Allen, New York, N. Y.
 533,416—Separable Wagon Axle. Harvey Hadden, Peekskill, N. Y.

Patents Expired February 5, 1912

- 533,501—Vehicle Brake. James F. Sinkler, Troy, Tenn.
 533,617—Draft Attachment for Vehicles. Henry B. St. John, Kalamazoo, Mich.
 533,635—Friction Clutch. John H. Cox, Moline, Kas.
 533,649—Automatic Vehicle Brake. Virgil A. Kemper, Marksburg, Ky.
 533,701—Pneumatic Tire. Kirk Brown, Montclair, N. J.
 533,704—Elastic Tire for Vehicle Wheels. Christopher C. Campbell, Springfield, Mass.
 533,742—Thill Coupling. William J. Powers, Bedford, Canada.
 533,757—Vehicle Spring. Charles L. Thomas, Buffalo, N. Y.
 533,820—Pneumatic Tire. John J. Koetzner, Washington, D. C.
 533,816—Running Gear for Vehicles. William J. Kauffman, Miamisburg, Ohio.

Patents Expired February 12, 1912

- 533,973—Valve for Pneumatic Tires. George H. Tansley, Hartford, Conn.
 533,986—Thill Coupling. George A. Fowler, Wichita, Kas.
 534,019—Vehicle. Charles H. Stratton, Buffalo, N. Y.
 533,990—Vehicle Wheel. Godfried Laube, Huron, S. D.
 534,048—Vehicle. Samuel Mills, Buckeye, City, O.
 534,121—Thill Coupling. Delbert B. McCapes, Vermillion, S. D.
 534,109—Wagon. Herman Just, Philadelphia, Pa.
 534,190—Vehicle Spring. Charles A. Behlen, Cincinnati, O.

Patents Expired February 19, 1912

- 534,282—Hanger for Vehicle Brake Shafts. Morgan Potter, Fishkill-on-the-Hudson, N. Y.
 534,285—Vehicle Seat. Thompson C. Shankland, Oakland, Cal.
 534,386—Vehicle Bolster. Charles F. Bettmann, Jr., New Albany, Ind.
 534,487—End-gate Fastener. William Walker, Scandia, Kas.
 534,497—Tire Tightener. George W. Demaree, Hervey O. Smith and John W. Ditmars, Whiteland, Ind.
 534,599—Pneumatic Tire. Clarence B. Bowling, Burr Oak, Mich.
 534,606—Tire. Edward E. Horton, Toronto, Canada.

Patents Expired February 26, 1912

- 345,643—Seat Support. Henry C. Ham, Liberty, Ind.
 534,653—End Gate for Wagons. David E. Lantz, Mattoon, Ill.
 534,709—Wagon. George M. Cleland, Salt Lake City, Utah.
 534,757—Ball-bearing Axle for Carriages. George W. Pomroy and Charles A. Hatch, Hartford, Conn.
 534,762—Pneumatic Tire. Robert P. Scott, Cadiz, Ohio.
 534,807—Vehicle Axle. Stephen O. Wilson, Raleigh, N. C.
 354,820—Wheelwright Machine. Seth C. Doane, Englewood, Ill.
 534,892—Carriage-top Spring. Willis W. Kruttsch, Coffeyville, Kas.
 534,897—Hub-attaching Device. Robert B. Liddell, Philadelphia, Pa.
 534,907—Buggy-top Support. Frank M. McMahon, South Canadian, Ind. Ter.
 534,936—Carriage. Herbert E. Wilford and Joseph T. Clarkson, Amesbury, Mass.
 534,937—Wagon Seat. Edward B. Winters, Coffeyville, Kas.

Patents Expired March 5, 1912

- 534,995—Thill Coupling. George Cargin, Wells, N. Y.
 535,002—Folding Vehicle Top. Albert Haberling, St. Louis, Mo.
 535,013—Metal Hub. John M. Kroener, Aurora, Ill.
 535,058—Thill Coupling. Walter L. Frazer, National City, Cal.
 535,206—Pneumatic Tire. Rudolph W. Huss, Cleveland, O.
 535,232—Fifth Wheel. Caleb R. Turner, Brooklyn, N. Y.

SETTLEMENT IN SIGHT IN ANDERSON CARRIAGE CO. RECEIVERSHIP

The way is now probably opened for a speedy settlement of the receivership case of the old Anderson (Ind.) Carriage Company. Claims aggregating about \$20,000 on which appeals had been taken to the Supreme Court have been compromised on a basis of 66 2-3 per cent., and the appeals dismissed. These claims will now figure in the settlement of the case at two-thirds their face value, an order to that effect having been made by Judge Austin. W. T. Durbin, receiver for the carriage company, may now proceed under the direction of the court to settle with claimants. The receiver will have at his disposal about \$10,000 with which to adjust \$300,000 in claims. Creditors will receive approximately 3 cents on the dollar.—Anderson Bulletin, February 29.

WHERE PAPER IS AS GOOD AS RUBBER

The Swinehart Tire and Rubber Co., Akron, Ohio, has adopted a method of advertising its tires which is effective, and at the same time economical in rubber. It has made for display purposes a number of large tires, 5 feet in diameter and 10 inches thick, exactly reproducing its motor tires. Obviously tires of this size made in the ordinary way would consume a valuable quantity of rubber, but these tires are made of papier mache and for window and other displays are quite as serviceable as if compounded of the finest Para.

CORBIN CEASES AUTOMOBILE PRODUCTION

After having had the matter under consideration for a year or more, the officials of the Corbin Motor Vehicle Corporation, of New Britain, Conn., finally has decided to dispose of the business and retire from automobile manufacture.

OBITUARY

Charles Lewis, 59, president of the Lewis Spring and Axle Co., Jackson, Mich., died suddenly February 24. He returned the night before from a business trip to New Orleans and was apparently in his usual health. Asthma caused his death. Mr. Lewis was born in England and came to this country when 14 years old. He located in Jackson, Mich., in 1893, when in a small way he began the manufacture of buggy springs, and later axles, from which the gigantic Lewis Spring and Axle Co. of today gradually developed. He also became interested in other enterprises, among them the E. C. Clark Motor Co., of Jackson, of which he was secretary and treasurer. He played a large part in the industrial and civic life of Jackson, and the esteem in which he was held was indicated by the character of his funeral, which was almost a state affair in which practically the entire city joined. Mr. Lewis for eight years had been a member of the Board of Public Works and had also been Fire Commissioner. He was a Master Mason, an Elk, a Knight Templar and a Noble of the Mystic Shrine. He leaves a widow, three married daughters and one son, Frederick H., who is treasurer and general manager of the Lewis Spring and Axle Co.

Allen W. Ball, aged 71, a well known carriage manufacturer, a member of the old firm of Ball & Ward of Newark, Ohio, is dead of paralysis. He was a civil war veteran.

Charles A. Davis, president of Davis & Co., dealers in carriages and implements, Sioux City, Ia., died February 20, of pneumonia, aged 57 years. His wife and one son, Henry, survive.

Francis M. Dye, 80, died suddenly while at work in his carriage shop at Laporte, Ind.

John C. Schafer, 83, for many years one of the leading carriage manufacturers of Pittsburgh, died January 23. He leaves one son and three daughters.

Wants

Help and situation wanted advertisements, one cent a word; all other advertisements in this department. 5 cents a word; Initials and figures count as words. Minimum price, 30 cents for each advertisement.

POSITION WANTED.

Position Wanted as blacksmith foreman and assistant superintendent of carriage factory. Have been filling both of above positions in popular priced carriage factories for many years; thoroughly experienced and willing to work. Address Peter Steinbecker, 109 Linden St., Carthage, O.

HELP WANTED.

Wanted—Competent carriage or automobile draftsman with experience in body designing. Must understand retouching and perspective and be capable of making a finished wash drawing. Permanent work for the right man. Address, stating experience and salary wanted Box 104, The Hub, 24 Murray street, New York City.

SECOND-HAND MACHINERY WANTED.

We are in the market for the following second-hand machinery in good condition: One Defiance No. 1 Improved Tire Bender, one West Hydraulic Tire Setter No. 4, one Long & Allstetter Tire Welder No. 2. Send full description and lowest price to Avoca Wheel Co., Avoca, N. Y.

PATENTS.

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 608 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

INDEX TO ADVERTISERS

American Roller Bearing Fifth Wheel Co. 12	Indianapolis Paste Co. 18	Payne, E. Scott & Co. 18
Bicknell Mfg. & Supply Co. 6	Jones & Co, Phineas 15	Perfection Spring Co., The..... 13
Buckeye Paste Co. 18	Kelly-Springfield Tire Co.....1st cover	Pettingell Machine Co. 5
Burling, W. G. 18	Kimble, Andrew & Co..... —	Porter, H. K. 12
Baltimore Hub & Wheel Co. 18	Keystone Sheet Metal Co. 4th cover	Racine Auto Tire Co. 16-17
Buffalo T. & T. Co..... 18	Keystone Paint & Filler Co. 15	Sherwin-Williams Co.....3rd cover
Columbus Bolt Works4th cover	Keystone Forging Co..... 12	Standard Steel Tube Co. 16
Crane & MacMahon 2nd cover	Landers Bros. Co. 17	Standard Wheel Co., Terre Haute, Ind.. 2
"Crescent" Body Works..... 18	Lewis Spring & Axle Co..... 15	Standard Oil Cloth Co. 4
Decker, J. C.3rd cover	Lourie Mfg. Co..... 17	H. Collier Smith & Co. 12
Delphos Hoop Co. 18	Masury, John W. & Son2nd cover	Smith, L. M. & Son 18
Devoe, C. T., & Reynolds Co.....3rd cover	Mayo Radiator Co. 6	Stinson & Son, Edw..... 18
Diefenthaler, J. V. 4	Meyer & Co., John C. 18	Straus & Son, 6
Dowler, Charles L. 18	Miller, A. J. & Co..... 12	Schlegel Mfg. Co. 13
Eccles, Richard Co. 12	Millikan, G. W. 18	Timken Roller Bearing Co. 1
Fabrikoid Co. 4	McKinnon Dash Co. 4th cover	United Rim Co. 2
Fairfield Rubber Co. 3rd cover	Metropolitan Lamp Co. 18	Valentine & Co. 3
Frost Gear & Machine Co. 15	Montague Malling Machine Co..... 18	Victor Rubber Co. 11
Gifford, John A. and Son 15	National Spring & Wire Co. 6	West Tire Setter Co. 17
Herbrand Co. —	New Wapakoneta Wheel Co. 1	Woodman, Joel H. 18
Higgin Mfg. Co. 4th cover	Ochsner & Sons Co., A. 18	Wiley & Co., C. A. 16
Hoopes Bros. & Darlington 2nd cover	Ohio Seat Co..... 18	Wilcox Mfg. Co. 14
		Zanesville Pole & Shaft Co.....

VICTOR SECTIONAL TIRES



The Truck Tire

That is Strongest in Construction, Simplest in Application, Most Satisfactory in Service.

Every Block Independent in Its Fastening.

Can be Used Single or Dual. Perfect Traction. More Resilient than Endless.

Write for Quotation and Guarantee.

VICTOR RUBBER CO.

Springfield, Ohio

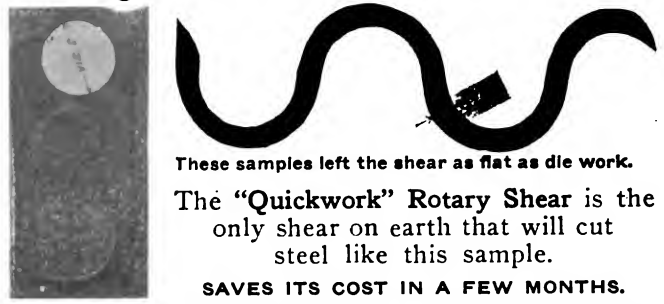
Please mention "The Hub" when you write.



A. J. MILLER & CO.
BELLEFONTAINE, OHIO
Makers of
**VEHICLE
BODIES and SEATS**

No. 361 Bentwood Seat.

The "Quickwork" Rotary Shear



These samples left the shear as flat as die work.

The "Quickwork" Rotary Shear is the only shear on earth that will cut steel like this sample.

SAVES ITS COST IN A FEW MONTHS.

Write for full information **H. COLLIER SMITH** Sole Inventor and Manufacturer.
125 Harper Ave., DETROIT, MICH.

Richard Eccles Co., Auburn, N.Y.
Manufacturers of
Forgings: Carriage, Wagon, Automobile' Special
Send for Catalogue No. 17.



*Crowe Name Plate
AND
Engraving Co., CHICAGO.*

ANY FINISH ETCHED NAME PLATES,
LIGHT LABELS, SUNKEN LETTER WORK AND EMBOSING.

PORTER'S BOLT CLIPPERS
"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 inch.

H. K. PORTER, EVERETT, MASS.

TRUCK BUILDERS

If you only realized the inestimable value of roller bearing fifth wheels on trucks, vans, delivery wagons and all other medium and heavy vehicles, no job would leave your shop without

Roller Bearing Fifth Wheels

WHY? The adjustment is perfect. No oil or grease required. Almost indestructible. Will outwear any vehicle. Saves horseflesh and prolongs life of vehicle. Ask your jobber for the celebrated

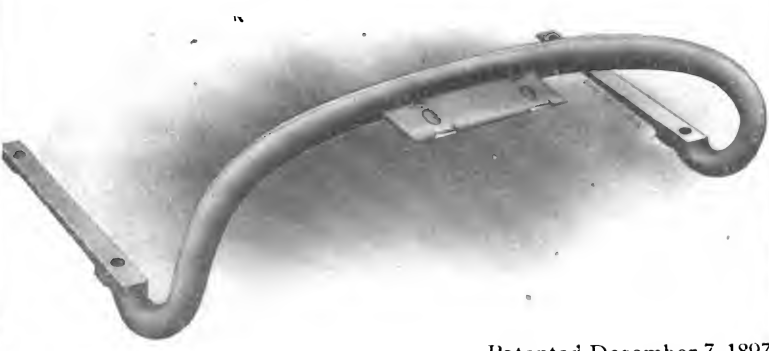
NIELSON OR KING

Let us send you Catalogue and Price List.
American Roller Bearing Fifth Wheel Co.
745 THIRD AVE., BROOKLYN, N. Y.



The Buckeye Handle Gear & Bending Co.
ALLIACE, OHIO
Manufacturers of Gear Woods
OUR OLD RELIABLE GEAR SET
The Most Complete Set on the Market. Write for Catalogue and Prices

Subscribe Now for THE HUB \$2.00 Per Year



Patented December 7, 1897

Bailey Body Hanger

BUGGY and SURREY SIZE

QUICK SHIPMENTS

WRITE FOR PRICES

The Keystone Forging Co.
Northumberland, Pa.

Please mention "The Hub" when you write.

ADVERTISEMENTS CLASSIFIED

AUTOMOBILES

Bailey, S. R. & Co., (elec.) Amesbury, Mass.

AXLES

Flint Axle Works, Flint, Mich.
 Frost Gear & Machine Co., Jackson, Mich.
 Lewis Spring & Axle Co., Jackson, Mich.
 Timken Roller Bearing Co., Canton, O.

BODIES, SEATS, ETC. (Wood and Metal)

Burling, W. G., Philadelphia, Pa.
 Crescent Body Works, Reading, Pa.
 Keystone Sheet Metal Co., Ambridge, Pa.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Wiggers Co., Cincinnati, O.
 Woodman, Joel H., Hoboken, N. J.

BOLTS AND NUTS

Columbus Bolt Works, Columbus, O.
 Russell, Burdall & Ward Bolt & Nut Co.,
 Port Chester, N. Y.

BOWS (Automobile and Carriage)

Millikan, G. W., Muncie, Ind.
 Delphos Hoop Co., Delphos, O.

BUCKRAMS.

Landers Bros. & Co., Toledo, O.

BUGGIES

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

CARRIAGE FORGINGS.

Columbus Bolt Works, Columbus, O.
 Cowles & Co., C., New Haven, Conn.
 Eccles Co., Richard, Auburn, N. Y.
 Herbrand Co., Fremont, O.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.

CARRIAGES AND WAGONS (Finished)

Bailey & Co., S. R., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

CARRIAGE, WAGON AND AUTOMOBILE
HARDWARE, SUPPLIES, ETC.

Chas. L. Dowler, Philadelphia, Pa.
 Gifford & Son, John A., New York City.
 Higgin Mfg. Co., Newport, Ky.
 Payne Co., E. Scott, Baltimore, Md.
 Landers Bros. Co., Toledo, O.
 Mohawk Valley Mfg. Co., Utica, N. Y.

COMMERCIAL MOTOR WAGONS, TRUCKS

Bowling Green (O.) Motor Car Co.

CUSHION MFGRS.

Chas. L. Dowler, Philadelphia, Pa.

COLORS

Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 Valentine Varnish Co., New York, Chicago,
 Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

DASHES, FENDERS, ETC.

McKinnon Dash Co., Buffalo, N. Y.
 Burling, W. G., (Metal) Philadelphia, Pa.

DISPLAY RACKS.

H. G. Dreyer & Son, Cleveland, O.

FIFTH WHEELS.

Eccles Co., Richard, Auburn, N. Y.
 Wilcox Mfg. Co., D., Mechanicsburg, Pa.
 American Roller Bearing Fifth Wheel Co.,
 Brooklyn, N. Y.
 Keystone Forging Co., Northumberland, Pa.

GEAR WOODS.

Buckeye Handle, Gear & Bending Co., Al-
 lance, O.

JACKS

Eureka Mower Co., Utica, N. Y.

LEATHER, PATENT AND ENAMELED

Diefenthaler, J. V., Newark, N. J.
 M. Straus & Sons, Newark, N. J.
 L. M. Smith & Son, Newark, N. J.

LEATHER SPECIALTIES

Decker, J. C., Montgomery, Pa.

LINSEED OIL

Sherwin-Williams Co., Cleveland, O.

MACHINERY AND TOOLS.

Bokop, Webb & Palm, Defiance, O.
 Porter, H. K., Everett, Mass.
 West Tire Setter Co., Rochester, N. Y.
 Frost Gear & Machine Co., Jackson, Mich.
 Pettingell Machine Co., Amesbury, Mass.

MACHINERY, (Woodworking)

Bicknell Mfg. & Supply Co., Janesville, Wis.
 Pettingell Machine Co., Amesbury, Mass.

MOUNTINGS (Including Lamps)

Crowe Name Plate & Engraving Co., Chicago
 Ochsner & Sons Co., A., New Haven, Conn.
 Metropolitan Lamp Co., Newark, N. J.

MUFFLERS (Auto)

Mohawk Valley Mfg. Co., Utica, N. Y.

PASTE

Buckeye Paste Co., Columbus, O.
 Indianapolis (Ind.) Paste Co.

RADIATORS.

Mayo Radiator Co., New Haven, Conn.

RIMS.

United Rim Co., Akron, O.

ROLLER CHAFE IRONS

Mohawk Valley Mfg. Co., Utica, N. Y.

RUBBER TIRES

Autos, Pneumatics, Etc.

Consolidated Rubber Tire Co., New York Cy.
 Racine Auto Tire Co., Racine, Wis.

Carriages, Solid, Etc.

Consolidated Rubber Tire Co., New York Cy.
 Victor Rubber Co., Springfield, O.

SEATS

Keystone Sheet Metal Co., Columbus, O.
 Ohio Seat Co., Cincinnati, O.
 Miller, A. J. & Co., Bellefontaine, O.

SLEIGH RUNNERS.

Schofield & Co., Freeport, Ill.

SHAFT COUPLINGS.

Eccles Co., Richard, Auburn, N. Y.
 Higgin Mfg. Co., Newport, Ky.

SHAFT STRAPS.

Decker, J. C., Montgomery, Pa.

SPRINGS (Cushion)

National Spring & Wire Co., Jackson, Mich.

SPRINGS, GEARS, ETC.

Frost Gear & Machine Co., Jackson, Mich.
 Lewis Spring & Axle Co., Jackson, Mich.
 Schubert Bros. Gear Co., Oneida, N. Y.

THREADS

Meyer & Co., John C., Lowell, Mass.

TRIMMING MATERIAL

Rubber Drills, Enameled Goods, Imitation
 Leather, etc.

Fabrikoid Works, Newburg, N. Y.
 Fairfield Rubber Co., Fairfield, Conn.
 Standard Oil Cloth Co., New York City.
 Schubert Bros. Gear Co., Oneida, N. Y.
 Landers Bros. Co., Toledo, O.
 Schlegel Mfg. Co., Rochester, N. Y.

TOPS

Buffalo T. & T. Co., Buffalo, N. Y.

VARNISHES, PAINTS AND JAPANS

Devos, F. W., and C. T. Reynolds, N. Y. C.
 Keystone Paint & Filler Co., Muncie, Pa.
 Moore & Co., Benj., Cleveland, O.
 Moller & Schumann Co., Brooklyn, N. Y.
 Masury & Son, J. W. New York and Chicago
 Pierce Co., F. O., New York City.
 Sherwin-Williams Co., Cleveland, O.
 Valentine Varnish Co., New York, Chicago,
 Boston.
 Willey, C. A. Co., Hunters Point, N. Y.

VEHICLES.

Bailey & Co., S. R. Inc., Amesbury, Mass.
 Parry Mfg. Co., Indianapolis, Ind.

WHEELS AND WHEEL STOCK.

Baltimore Hub & Wheel Co., Baltimore, Md.
 Crane & MacMahon, New York City.
 Union City Wheel Co., Union City, Ind.
 Gifford & Son, John A., New York City.
 Hoopes Bros. & Darlington, West Chester, Pa.
 Jones & Co., Phineas, Newark, N. J.
 New Wapakoneta Wheel Co., Terra Haute,
 Ind.
 Stinson Edw. W. & Co., Baltimore, Md.
 Standard Wheel Co., Terre Haute, Ind.
 Standard Wheel Co., Toledo, O.
 Shortsville Wheel Co., Shortsville, N. Y.

STEEL WHEELS

Standard Wheel Co., Toledo, O.

WOOD STOCK, BENT WOOD, ETC.

Buckeye Handle, Gear & Bending Co., Al-
 lance, O.
 Crane & MacMahon, New York City.
 Delphos Hoop Co., (Bows) Delphos, O.
 Gifford, John A. & Son, New York City.
 Millikan, G. W., Muncie, Ind.
 Woodman, Joel H., Hoboken, N. J.

WHITE LEAD.

Sherwin-Williams Co., Cleveland, O.

MISCELLANEOUS

Oliver Typewriter Co., New York—Chicago

THE SCHLEGEL MFG. CO

Canopy Top Fringe
 Broad Lace
 Seaming Lace
 Pasting Lace
 Holder Tassels
 Curtain Cord
 Door Cord
 Rosettes
 Tufts
 Frogs
 Speaking Tubes
 Hat Racks
 Luggage Carriers

Manufacturers of

Fast Color Carriage and
 Automobile Trimmings
 of HIGHEST QUALITY

ROCHESTER,

N. Y.

High Grade Motor Truck

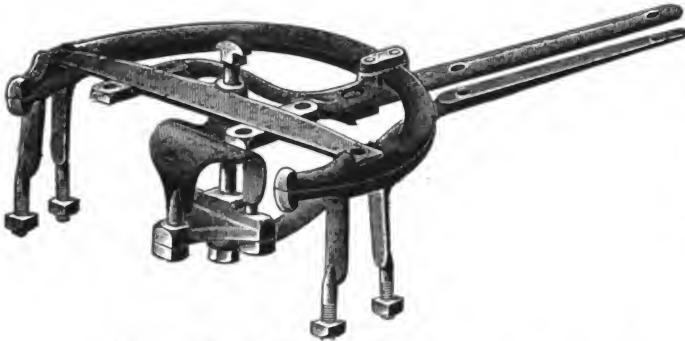
SPRINGS



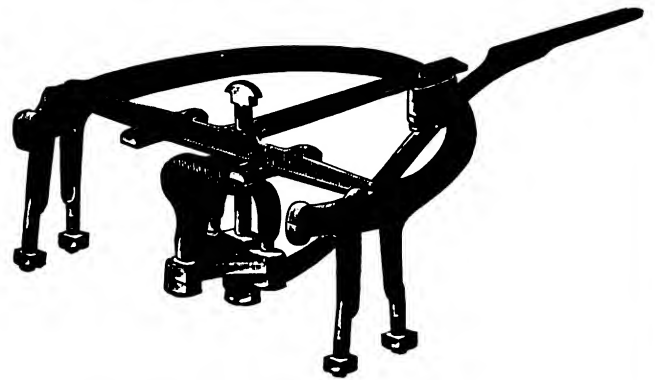
THE PERFECTION SPRING CO.

Cleveland, Ohio.

HEADQUARTERS FOR SPECIAL FINE GEAR IRONS [Dropped Forged] CARRIAGE HARDWARE



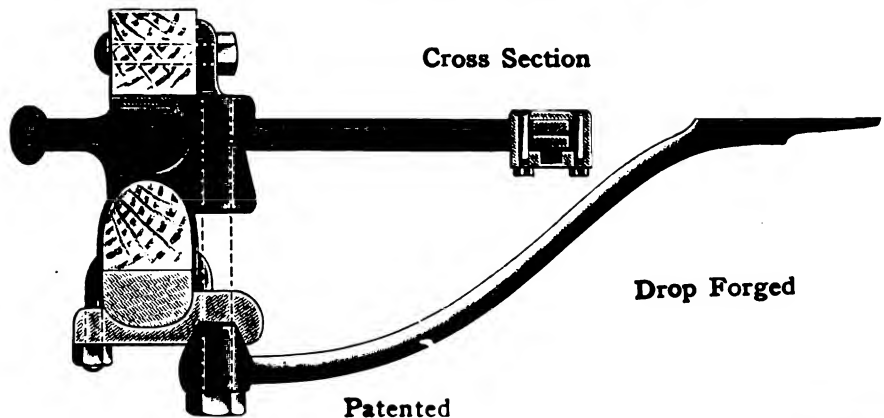
No. 1908—Gear Iron



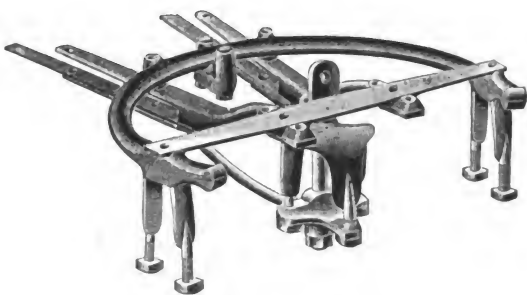
No. 2000—Gear Iron

WILCOX'S Mechanical 3 Prong King Bolt

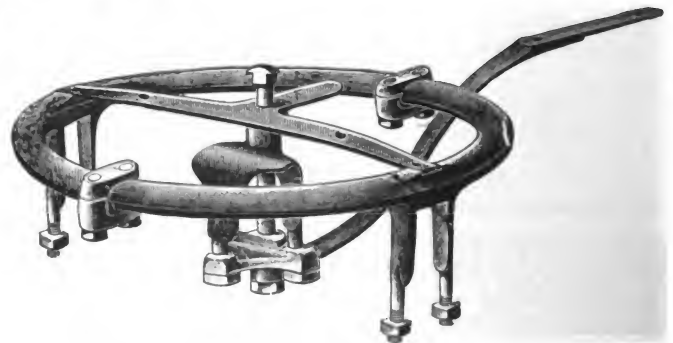
Double Locked in Head Block
Plate and King Bolt Yoke. No
Strain on Bolt. No Turn on
Nut. Guaranteed.



S
U
R
E
S
A
F
E



No. 1905—Gear Iron



No. 1909—Concord.

Forget your trouble and decide at once to use WILCOX DROP
FORGED IRONS. Write us for pleasure

The D. Wilcox Mfg. Co. Mechanicsburg Pa.

Please mention "The Hub" when you write.

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

SPRINGS

LEWIS SPRING & AXLE CO.

JACKSON, MICHIGAN

GEARS

We have Automobile
Gears for every purpose
in stock upon which
we can save you money.

FROST GEAR & MACHINE COMPANY
JACKSON, MICHIGAN



KEYSTONE BLACK FILLER

MAKES A PERFECT

ROUGHSTUFF

For Automobile Bodies and Parts

It fills the pores of Metal and Wood perfectly. Sand-
papers easily and produces a fine, smooth surface
that DOES NOT CRACK, SCALE NOR PEEL.

POMEROY & FISCHER, New York
Selling Agents to Vehicle Trade

KEYSTONE PAINT AND FILLER CO., Muncy, Pa.

Jones Wheels

BEST ON EARTH

KANTSAMORE

Phineas Jones & Co.

NEWARK, N. J.

Branch Factory:

12th Ave. and 55th St., New York City.

EVERY·AUTOIST·A·CUSTOMER·&·EVERY



THAT'S what you want, friend DEALER, and that's good news involved in the handling of

THE RACINE AUTO TIRE

We'll tell you why!

BECAUSE, your customer will not be worried by seeking to avoid the many sharp things that puncture other tires, for they won't puncture THE RACINE as it takes a pressure of over 4,000 pounds to puncture the chrome tanned leather outside jacket.

BECAUSE, your customer will find it unnecessary to carry that extra tire; four good revolving tires (RACINE AUTO TIRES) being all he will need.

WILLEY'S COLORS

The RECOGNIZED STANDARD



C. A. WILLEY CO.

COLORS GRINDERS

and Manufacturers of Specialties in

CARRIAGE, AUTOMOBILE AND CAR

PAINTS

COLORS, VARINSHES, ETC.

HUNTER'S POINT, NEW YORK CITY

THE STANDARD STEEL TUBE COMPANY

Manufacturers of

STEEL TUBING

SPECIAL BENT TUBES for
AUTOMOBILES, MOTOR-
CYCLES, BICYCLES and
MACHINERY of all kinds
a specialty.

Toledo, Ohio,

U. S. A.

CUSTOMER·A·SATISFIED·CUSTOMER

BECAUSE, those cup-like studs that you see in our illustration will grip the ground just where, and just when, the ground needs gripping; so that he is free from the danger of skidding and slipping.

BECAUSE, his tire EXPENSE account will show a difference such as will cause him to talk enthusiastically to others about you and the RACINE AUTO TIRE.

All this counts for good business; so get busy. The RACINE AUTO TIRE is going into the hands of live, pushing dealers. We shall make it equally advantageous to them as to us. Be amongst the live ones. Take our proposition. Do it now; and together let us do it thoroughly.

RACINE AUTO TIRE COMPANY

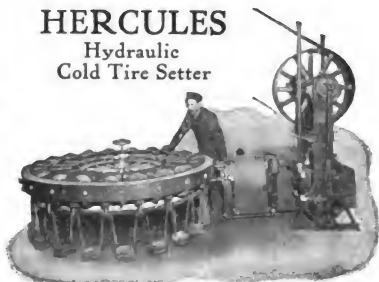
500 14th Street

RACINE, WISCONSIN



HERCULES Hydraulic Cold Tire Setter

HERCULES
Hydraulic
Cold Tire Setter



Sent on trial
fully guaranteed.

HYDRAULIC

Hub Bands
Box Presses
Bulldozers

LOURIE MFG. CO.,

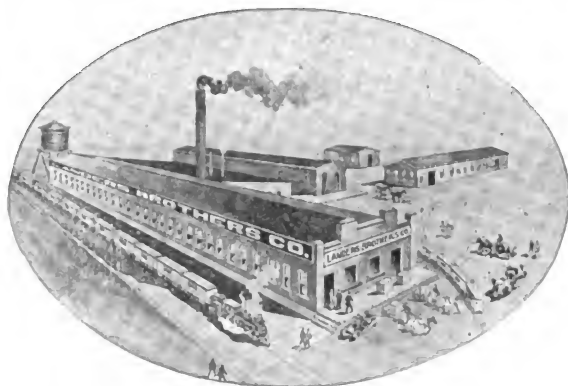
Springfield, ILL.

Successor to National Machine Co., of Keokuk, Iowa

Buckram, Webbing,

Made in Our Factory

Burlap, Strain Straps, Celluloid



Top Material,
Fibre Cord,
Wadding,
Enamelled Muslins, Drills and Ducks

Sheeting,
Bow Lining,
Cushion Canvas,

Landers Brothers Co.,
TOLEDO, OHIO.

Prompt Shipments

Best Goods

Lowest Prices

The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE



Tires set cold in one minute. This machine saves time—does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim, and thus make the tire loosen prematurely.

Saves resandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO.,

ROCHESTER, NEW YORK

BUSY BUYERS BRIEFS

John C. Meyer & Co. Threads
Manufacturers of
HIGH GRADE
and **SPOOL SILKS** for Carriage
and Automobile Trade
LOWELL, MASS.

The "CRESCENT" Body Works
Reading, Pa.
Builders of **Auto Bodies** to order
Of Wood or Metal in the White or Finished.

L. M. SMITH & SON
Leather
Carriage, Furniture and Automobile
NEWARK, N. J.
59-71 Lock St. 234-236 Central Ave.
Office 59 Lock St.

G. W. MILLIKAN
Manufacturer of
HIGH GRADE BOWS OF ALL KINDS
AUTO BOWS a Specialty.
Muncie, Ind.

Baltimore Hub-Wheel & Mfg. Company
Manufacturers of
Wheels AUTO MOTOR CAR
CARRIAGE
WAGON
Also **SPOKES and RIMS**
Factory: Harford Ave. and B. & O. R. R.
BALTIMORE MD.

KIMBLE'S Famous Gear Woods
still represent the highest standard of ex-
cellence and quality. True to our motto
our line wins the approval of all vehicle
builders. What can we do for you?
ANDREW KIMBLE, Zanesville, Ohio.

CHARLES L. DOWLER
CARRIAGE AND WAGON HARDWARE
108 North Third St., Philadelphia, Pa.
CUSHION MAUFACTURER
Pure Stearic Acid Candles. Wheel Stock. Snow
Flake Axle Grease.

Special Carriage Trimmers Paste
GUARANTEED VERMIN PROOF
Get our prices on our No. 38 before
making your 1912 contracts.
BUCKEYE PASTE CO.
COLUMBUS, OHIO The Hub

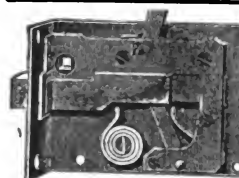
METAL PARTS FOR MOTOR BODIES
Hammered Work a Specialty
Fenders, Gasoline Tanks, Japanning Ovens
W. G. Burling 1924 Commerce Street,
PHILADELPHIA, PA.

DELPHOS HOOP COMPANY
MANUFACTURERS OF
HIGH GRADE BUGGY and AUTOMOBILE BOWS
Delphos, Ohio
No Order Too Large Or Too Small Mention HUB

OHIO SEAT COMPANY
CARRIAGE AND AUTO WOOD WORK
SEATS OF EVERY DESCRIPTION
1964-66 Central Ave. CINCINNATI, O.
Frank Medeweller. Prop.

This space is especially re-
served for some wise adver-
tiser. Are you wise?

Carriage Trimmers' PASTE
Fourteen years the standard
OUR LATEST PRODUCT
"Trimmers' Stickstay"
A Sure-Sticking Dry product that WILL NOT FREEZE.
Free Samples on Demand.
INDIANAPOLIS PASTE CO., Indianapolis, Ind.



A. Ochsner & Sons
COMPANY
1061 State St. N. H. Conn.
Auto and Carriage
Locks, Hinges, Fix-
tures, Etc., and
Bodymakers Tools

Quality, Style, Durability and Quick
Delivery.

The Edward Stinson Mfg. Company
VEHICLE WHEELS
327-335 North Street, BALTIMORE, MD.

H. Welchhold L.D. Phone, 2290-W Market
METROPOLITAN LAMP COMPANY
Manufacturing and Repairing of
AUTOMOBILE SEARCH and SIDE LAMPS
COACH and CARRIAGE LAMPS
Makers of All Kinds of Metal Goods. Nickel
and Silver Plating.
24 Mechanic St., NEWARK, N. J.

E. SCOTT PAYNE CO.
Carriage and Automobile
HARDWARE
Horse - Shoers' Supplies
362-364 North Gay St., BALTIMORE, MD.

AUTO and CARRIAGE TOPS
and **TRIMMINGS** any quantity
Built Quick. Prices Right.
BUFFALO T. & T. COMPANY
108 TERRACE, BUFFALO, N. Y.

The Montague Hand Addressor

Three Times as Fast as
your stenographer with
her typewriter—your
bookkeeper or any other
employee with the pen.

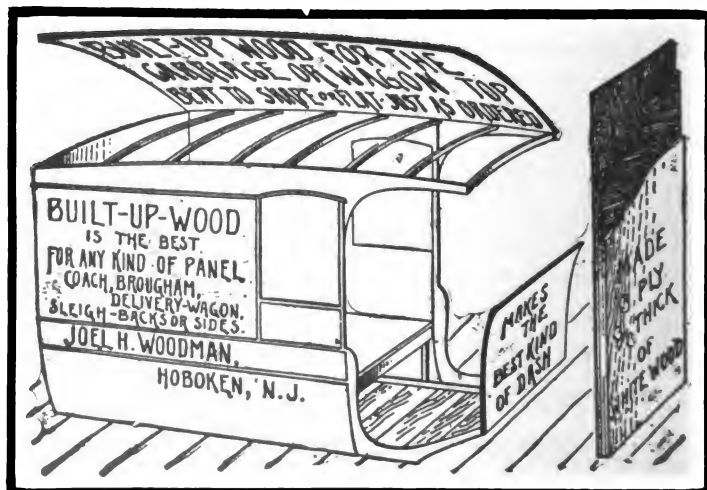


A simple, practical addressing machine for rapid and accurate
addressing of envelopes, post cards, bills, shipping tags,
wrappers—heading up and filling in of various office and shop
forms. Prints typewriter type from a typewriter ribbon.

The price is \$15.00

No matter how limited or extensive your business we have
information for you both interesting and profitable.

Montague Mailing Machinery Co.
Chattanooga, Tenn.



Please mention "The Hub" when you write.

F. W. DEVOE & C. T. RAYNOLDS CO.

101 and 103 FULTON STREET, NEW YORK

Manufacturers of

F. W. DEVOE & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

C. T. RAYNOLDS & CO'S {
COACH COLORS
VARNISHES
BRUSHES
SPECIALTIES

FOR PAINTERS, ARTISTS AND DECORATORS

All the brands and specialties of F. W. Devoe & Co. and C. T. Raynolds & Co. will be maintained separately as heretofore.



A Durable and Attractive Finish

TO produce an attractive, full, rich and durable finish it is most essential that the surface be properly prepared. To accomplish this we recommend the use of materials which are especially designed for a specific purpose. S-W Products are so constructed that a perfect finish is possible. All coats bond thoroughly with each other, and the result is a distinctive, well-rounded out and durable finish. ¶ The line includes:

S-W Body & Gear Primers

S-W Metal Primers

S-W Rough Stuff

S-W Gear Fillers

S-W Surfacer

S-W Ground Colors

S-W Q D Colors

S-W Color Varnishes

S-W Finishing Varnish

Your inquiries will be promptly answered

SHERWIN-WILLIAMS PAINTS AND VARNISHES

CLEVELAND.

CHICAGO,

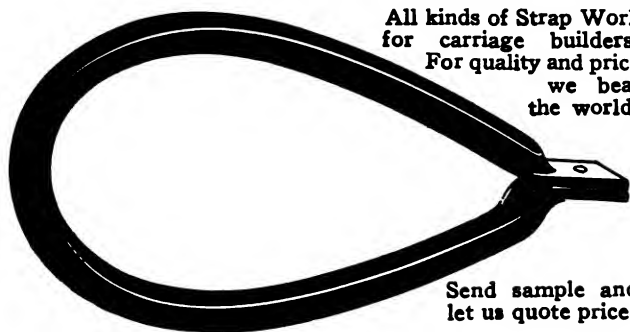
NEWARK,

MONTREAL,

LONDON, ENG.

AUTOMOBILE, CARRIAGE and HARNESS SPECIALTIES

All kinds of Strap Work for carriage builders. For quality and price we beat the world.



Send sample and let us quote prices

J. C. DECKER

Montgomery Pa.

THE FAIRFIELD RUBBER COMPANY

Manufacturers of

Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.

FAIRFIELD,

CONNECTICUT

McKINNON DASH COMPANY

BUFFALO, N. Y.

TROY, OHIO,
CINCINNATI, OHIO.

ST. CATHARINES,
ONTARIO.



No. 263-N with Nickel Rail.

ARE YOU IN LINE

With the Leaders for 1912?

THEY WILL USE DASH RAILS

Welded Solid To The Dash Frame

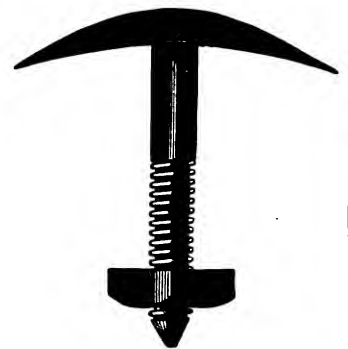
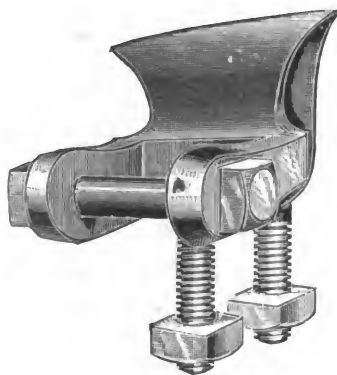
Skewed Shaft Couplings

**Regular or Oval Patterns
For High Arched Axles**

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
Couplings, Carriage Hardware and Special Forgings

Catalogue "H" and Prices on Application.

COLUMBUS BOLT WORKS, Columbus, O.



All Steel Piano Box Buggy Bodies One Piece Steel Seats

No More
Checks,
Splits,
Corner
Breaks



Patent
Applied For

Write for our illus-
trated catalog show-
ing a number of our
other seats.



Furnished to most any width desired.

Keystone Sheet Metal Co.

Factory, Economy, Pa.

Office, Ambridge, Pa.

The Higgin

LINE OF CARRIAGE TRIMMINGS

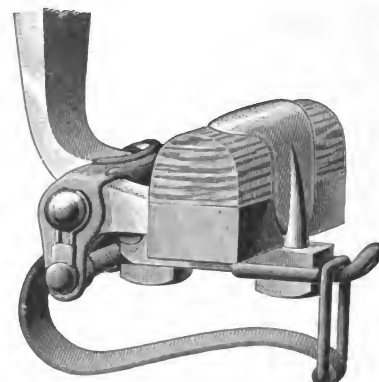
KNOBS



No. 70.



No. 133



(Closed.)
The Higgin Quick Shifter.

KNOBS



No. 72.



No. 130.



Full Leather Nut



No. 74.



Black Japan Nut

QUALITY UNSURPASSED.

Send for catalogue and get acquainted with our line.

The Higgin Mfg. Co.

Newport, Ky.

